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An investigation into grassroots initiated networked communities as a means of addressing the digital divide

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Thesis submitted in partial fulfilment of the requirements
for the degree of Doctor of Philosophy

Knowledge Media Institute

The Open University

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Abstract

Despite two decades of government and commercial intervention, a digital divide persists in the UK. Access to internet connectivity and the associated tools and services that permit full participation in the information society greatly varies.

Researchers argue that a more complex set of insufficiencies must be overcome and continually re-addressed to enable individuals and communities to make meaningful usage of the internet to enhance their activities.

This thesis examines the discourse surrounding the digital divide and investigates one response: the establishment of grassroots initiated networked communities.

These initiatives represent local neighbourhoods attempting self-provisioning solutions; appropriating technology within their own communities to connect residents to each other, and the wider world through the internet, often building on an existing set of social relationships and ongoing interaction.

The research consists of a literature review, a survey of grassroots initiated networked communities in the UK, and the collaborative development of software tools to enhance community interaction working alongside two communities. An analysis of the motivations and goals of these initiatives is presented based on the survey and interviews with ten groups, providing evidence of a range of activities and a simple typology of initiatives, which I define as Pioneers, Subcultures and Cooperatives. The thesis provides recommendations to practitioners and policy makers on how best to support such initiatives, and indicates useful areas of further research.

The collaborative development of software tools alongside two initiatives reveals the challenges of undertaking a participatory research approach and identifies barriers to social software adoption. I identify that grassroots community responses to the digital divide face challenges, including achieving critical mass, sponsorship, and sustainability. The research concludes by establishing that grassroots initiated networked communities are a valid response to overcoming the digital divide, and that a community approach offers shared motivation, social support, and knowledge sharing.

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1 Introduction

This chapter considers the background to the research problem, introduces the research study, and lays out the research propositions. The aims and objectives are listed and the outline of research and the thesis structure described.

1.1 Background to the research

Despite over two decades of debate and government led interventions, a ‘digital divide’ exists in the UK. There is an uneven distribution across the country of internet service provision (Hunt 2010; Satchell 2010). Access to tools and services enabling individuals and communities to fully participate in what has been called the information society (Castells 1996) varies from place to place.

Since the 1980s, policymakers in the UK have pursued the goal of an information society based on a computer network infrastructure accessible by all. The UK government has sought to realise the vision of a ‘knowledge economy’ where a large proportion of income to the country is based on knowledge industries and an educated, online population. The knowledge society is believed to bring social as well as economic benefits including greater access to information, communication amongst individuals, and the opportunity for better education.

Influenced greatly by developments in the USA, the UK government has funded pilot projects to increase wider access to the internet. Early projects focussed on providing central community resource centres (sometimes referred to as telecentres) and more recent projects have considered access to individual homes. However, many of these projects have been short term, and focussed on providing access. Writers such as DiMaggio and Hargittai (2001) argue a more complex set of inequalities must be considered if individuals and communities are to be able to make meaningful usage of the internet to enhance their activities. DiMaggio and Hargittai define these inequalities as equipment (the quality of computer hardware, software, and internet access), autonomy (the control an individual has over how they can use their connection), skill (the knowledge to make best use of the equipment and access), social support (being able to draw on others to develop skills and overcome obstacles) and purpose (to have meaningful reasons to be connected). Furthermore, a short term project based approach may not prove to be the most sustainable method of getting people online and helping them to stay connected; this approach is necessarily limited in its goals, funding and reach. A more sustainable approach may be to consider an open ended initiative based philosophy where there is no assumed end point to support or provisioning (Day and Cupidi 2004a). Externally driven and funded pilot interventions (sometimes referred to as 'top-down') have made some impact on supporting the development of a networked society, however progress is still incomplete. There is still the danger that this new technological revolution may add another dimension of inequality to groups already suffering from other aspects of social exclusion.

Meanwhile, there has been an emerging phenomenon of local neighbourhoods attempting self-provisioning solutions; appropriating technology within their own communities to connect residents to each other, and the wider world through the internet. These initiatives are small and based around communities of locality, often developing in neighbourhoods where there is an existing set of social relationships and ongoing interaction. Such initiatives echo earlier precedents of communities innovating grassroots solutions to access new technologies like the telephone (Fischer 1992) and television (Cochrane 2003). I propose that it may be that such grassroots initiated developments can offer lessons that can be more broadly applied to other top-down and partnership based initiatives; for example in the increasing number of ‘wired neighbourhoods’ that have been planned.

This research is positioned in the community informatics field and considers the usage of information communication technologies (ICTs) within a social context. Community informatics refers to the exploration of ICTs as tools for transformation within “community development, economic regeneration, democratic renewal and social support” (Loader and Keeble 2004, p.9) and has been popularised over the last decade through the works of such researchers as Michael Gurstein in Canada (2000a) and Brian Loader in the UK (2004). Gurstein describes community informatics as

“ a technology strategy or discipline which links economic and social development efforts at the community level with emerging opportunities in such areas as electronic commerce, community and civic networks and telecentres, electronic democracy and on-line participation, self-help and

virtual health communities, advocacy, cultural enhancement, and others”

(Gurstein 2000b, p.1)

This research examines self-provisioning responses by communities seeking to overcome perceived or actual digital divides. There have been a range of exogenously initiated networking projects instigated and reported on by a range of governmental, commercial and academic bodies, however, little research has been undertaken to investigate grassroots initiated networking projects.

I will examine grassroots responses to the digital divide. The fieldwork will consist of two phases: first, I will undertake a survey of grassroots initiated networking projects, investigating examples of local residents networking their own neighbourhoods to provide affordable shared access to the intranet, and seeking to enhance intra-community communications through the use of networked computing tools (‘social software’). Secondly, I will work alongside two groups, helping to develop local intranets to support social interactions and community development and will report on the processes and progress made.

The research has grown from my own background as a practitioner, setting up and running one such community network, and I aim to broaden this experience to consider grassroots networked communities in a wider context. The thesis is written from my perspective both as a practitioner and an academic researcher, and adopts a participatory design influenced methodology. Therefore an important part of the research has been to reflect upon this methodological approach as a participant-

researcher, rather than exploring the phenomenon as an outside, ‘objective’ researcher.

1.2 Research propositions

The primary goal of this research is to explore and describe the phenomenon of grassroots initiated networked communities: neighbourhoods that have established their own network infrastructures and developed associated tools and services to support community interactions. Based on the context described in the previous section, the research is built on the following research propositions:

Proposition 1: Bringing citizens online as part of a community, rather than individuals, is a more effective and sustainable method of enabling individuals to ‘cross the digital divide’ and stay across the divide. An individual is more likely to cross the divide and stay across as part of a community. The community can offer support, and brings with it social needs and purposes.

Proposition 2: Developing a bottom-up networked community project based within an existing community of locality, where there is already a significant level of social interaction, is more likely to succeed than implementing a top-down networked community project into an arbitrarily selected community.

Proposition 3: Appropriate social software can enhance participation within, and the sustainability and evolution of, a networked community.

1.3 Aims

Based on the research propositions, the aims of the investigation are:

Aim 1: To evaluate the prevalence of grassroots initiated networked communities in the UK, to investigate the goals, motivations, and objectives of these communities and their modes of operation

Aim 2: To explore the role that social software might play within these communities and understand the factors that may lead to its successful adoption

Aim 3: To draw lessons from grassroots initiated networked communities that can be applied in future networking initiatives and inform decision making at policy level.

These aims will be achieved through the following:

- A critical evaluation of the digital divide discourse through the lens of community informatics to understand how it has affected network provision in the United Kingdom (Chapter 2)
- An examination of methodological approaches for undertaking a participatory study (Chapter 3)

- A comparative analytical evaluation of a range of UK grassroots initiated networked communities (Chapters 4 and 5)
- A survey of social software usage within grassroots initiated networked communities (Chapters 6 and 7)
- An analysis of grassroots initiated networked communities and how they may inform future networking projects (Chapters 8 and 9)

1.4 Research stages

This study is constructed of three key phases, and will use multiple research methods in order to triangulate data. A description and justification of these methods are found in Chapter 3, along with a discussion of their limitations.

Phase 1: A literature review of the current state of academic research into the key issues surrounding the research: the digital divide, philosophical and theoretical stances, policy and practical responses.

Phase 2: A general survey of networked communities, gathered via literature review, leading to semi-structured interviews with initiators of ten communities identified through the “snowball method” of expanding contacts via participating respondents’ social networks (Atkinson and Flint 2001).

Phase 3: A case study investigation of two groups. Their use of social software tools in the form of an intranet developed in collaboration between myself and the communities, and the use of the community network itself, carried out through interviews, focus groups, semi-structured interviews, quantitative data collection, follow-up interviews and supported by ethnographical methods.

In practice, the deployment of social software tools did not occur in one of the two groups, leading to reflections (described in Chapters 6, 7 and 8) on the lessons that can be drawn from this research experience.

A timeline of each phase of the research is presented in Figure 1-1, following.

	2003				2004				2005				2006				2007				2008	2009	2010	2011
	Jan-Mar	Apr-Jun	Jul-Sept	Oct-Dec	Jan-Mar	Apr-Jun	Jul-Sept	Oct-Dec	Jan-Mar	Apr-Jun	Jul-Sept	Oct-Dec	Jan-Mar	Apr-Jun	Jul-Sept	Oct-Dec	Jan-Mar	Apr-Jun	Jul-Sept	Oct-Dec	Jan-Dec	Jan-Dec	Jan-Dec	Jan-Mar
Lit. review																								
Pilot study																								
<i>Fieldwork Phase 1</i>	<i>(Survey of community networks)</i>																							
Initial survey																								
Interviews																								
Analysis P1																								
<i>Fieldwork Phase 2</i>	<i>(Case study research)</i>																							
<i>Digcoop</i>																								
Focus groups																								
Software dev.																								
Deployment																								
<i>Mehetnet</i>																								
Focus groups																								
Software dev.																								
Deployment																								
Analysis P2																								
Write up																								

Figure 1-1: Timeline of research phases

Note:

Writing up and analysis of fieldwork continued until PhD submission, January 2011.

Deployment of social software did not occur in Mehnetnet.

1.5 Structure of the thesis

This thesis is in the following sections:

Chapter 2 considers the broader environment surrounding the research work. I first look at the question of the digital divide, and then consider the concept of community. Drawing these two concepts together, I look at the idea of social software and how it might enable community to be supported by ICT.

Chapter 3 considers the methodology underpinning the study, and explains how the research was organised and carried out by examining the specific instruments used, and a reflective consideration of possible problems. The chief methodological tools are considered, and a summary of the major schools of thought. The specific instruments used to undertake the research are then explored.

Chapter 4 describes the grassroots networked communities interviewed in the first part of the research. Communities are introduced and key features described. I consider the possible range of UK grassroots initiated networked communities and focus on ten specific examples.

Chapter 5 analyses the data collected in Chapter 4: patterns are identified and key findings are presented.

Chapter 6 describes the participatory research undertaken with two groups: the planning and establishment of community intranets with social software to support neighbourhood interactions. I report on the processes and progress made.

Chapter 7 analyses the barriers to successful social software introduction. I analyse the challenges found in establishing the intranets in the two communities through the lens of three key works, and identify a number of key factors that may be responsible for their limited uptake.

Chapter 8 provides an overall summary of the study, reflecting on the work, and considers methodological challenges encountered.

Chapter 9 considers the work in a broader context and discusses the potential for further research.

2 Literature review: From digital divide to digital insufficiencies

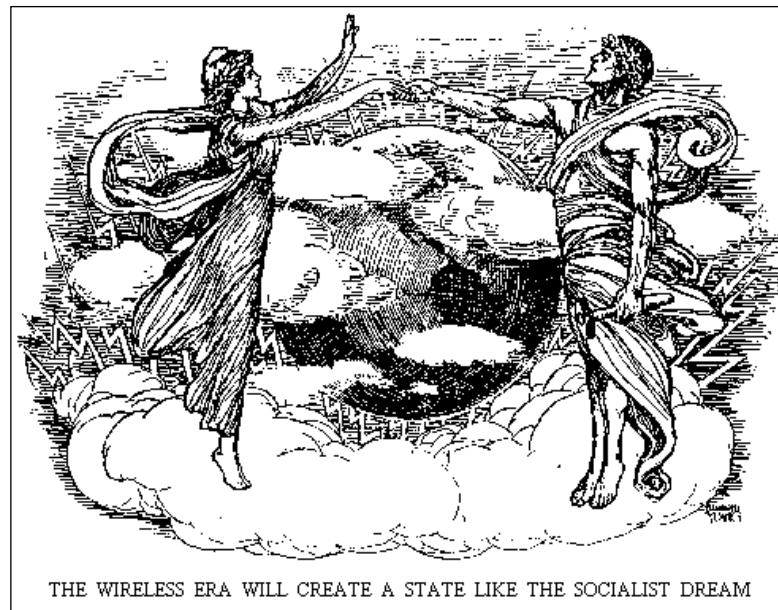


Illustration from: Narodny, I. Marconi's Plans for the World.

Technical World Magazine, Vol. 16, October 1912, pp.145-150

2.1 Introduction

This chapter examines the context in which the research has been carried out through identifying key papers in the field. The research is constructed on the premise that community networks are based within both social and technical frameworks, and that the interplay between both of these shapes and is shaped by the host communities'

usage of such networks. Therefore this literature review considers both sociological, and information and communication technology (ICT) fields.

The second purpose of this literature review is to identify gaps in the field and hence establish the significance and innovation of the study and its contribution to knowledge. The rapidly changing technological environment and its effect on community interaction has been studied in the fields of sociology and community informatics. However, much focus has been placed upon the study of virtual communities of interest and practice, and top down external interventions into local neighbourhoods. Little research appears to have been carried out into studies of locally organised grassroots networks.

First of all, I consider the historical perspective of the idea of the information society, and situate the thesis within research on the use of the internet. I describe the concept of community, and how it is applied to this research. Next, I consider how a community approach may be a useful response to overcome multiple digital insufficiencies within society, and analyse the possible benefits of employing ICT to enhance community communications and interaction opportunities.

I then turn to looking at specific responses, exploring community networks, the development of community based ICT services to support local neighbourhoods. These include networked communities: localities that have developed a network infrastructure to support social interaction and share access to the internet. I examine examples of both externally initiated projects, and self-organised grassroots initiatives. Finally, I focus on ‘social software’: software used to support social

interaction, and describe how it may be applied within community networks. I look at how social software may be used with both distant and proximate communities.

This literature review identifies the state of discourse at the beginning of the fieldwork period (2004) and has been updated to reflect some of the developments since. However, in a rapidly moving technological environment it is clear that some aspects have changed in the intervening period and new directions have emerged. I have indicated more recent developments in the summarising chapters, 8 and 9.

In this section I consider the thesis within the broader framework of the development of the internet. I explore how the concept of the digital divide arose from the information society, digital access, and more complex interpretations for the divides in usage. I discuss the role of individuals within this framework, identifying them as active participants rather than passive recipients of a technology.

2.1.1 An historical perspective to the digital divide

This thesis considers how some local communities are responding to a perceived lack of ICT resources, what has broadly been described as the ‘digital divide’. The concept of the digital divide has its origins in the idea of ‘information haves’ and ‘information have-nots’; the belief that as we move into an ‘information society’ (Castells 1996) information becomes more significant in people’s lives and a lack of access can disadvantage citizens as much as any other resource.

The idea of the ‘information society’ is the belief that our current society has moved from being based on the production, distribution and diffusion of material goods, to a

social and economic model based on the organisation, use and manipulation of information and knowledge (May 2002, p. 1). Early analyses focused on the USA (Machlup 1962; Porat 1977), though the arrival of the internet as a mass medium has triggered a global interest in the concept, and renewed interest in whether a post-industrial, knowledge economy has now emerged in developed countries.

In 1970, Tichenor et al. noted a “knowledge gap” caused by mass media, noting that “segments of the population with higher socio-economic status tend to acquire [...] information at a faster rate than the lower status segments, so that the gap in knowledge [...] tends to increase rather than decrease” (Tichenor, Donohue et al. 1970, pp. 159-160). The authors were concerned that this gap would have “a profound social effect, and may be a central factor in future social change” (ibid, p.170). The concern that a resource gap between sectors of society may cause social inequalities to arise is not new, however with the move from industrialised to post-industrial society, greater emphasis has been placed on knowledge as a resource that may be unevenly distributed.

Governmental enthusiasm to connect industry and society to the new “information superhighways” (National Information Infrastructure 1992) raised the spectre of an increasing gap in access to the new information and communication technologies (Anderson, Bikson et al. 1995). One early analysis of inequalities of access to ICT was the 1995 US National Telecommunications and Information Administration (NTIA) report ‘Falling Through the Net: A Survey of the Have Nots in Rural and Urban America’ (National Telecommunication and Information Administration 1995). The NTIA was exploring whether the US government’s goal of ensuring

universal access to telephones had been achieved, but extended its research to study penetration rates of computer and modem ownership. The 1995 report identified that “(w)hile a standard telephone line can be an individual's pathway to the riches of the Information Age, a personal computer and modem are rapidly becoming the keys to the vault” (ibid.). This survey was followed up with a second, ‘Falling Through the Net II: New Data on the Digital Divide’ that noted that the US government had “made it a fundamental goal to connect all Americans to the information infrastructure” (National Telecommunication and Information Administration 1998). This report noted that while ownership rates for computers, modems, and email accounts had increased dramatically, there was an increasing disparity between segments of society.

In Europe, the European Commission drew attention to the increasing importance of information-based economies:

“... the information society is on its way. A digital revolution is triggering changes comparable to last century's industrial revolution with the corresponding high economic stakes. The process cannot be stopped and will lead eventually to a knowledge based society” (European Commission 1994).

The European Union identified ICT responses across society to ensure Europe kept up with this radical change it envisaged. Similarly, in the UK, a 1996 paper ‘Government Direct’ set out the government's vision to increase the electronic delivery of information and services, but raised the problem of ensuring universal access (UK Government 1996). The UK Government launched the “IT for All”

campaign in December 1996 (Dabinett 2000, p. 159). This vision was supported by the following New Labour government, declaring that it sought to ensure the UK would be “a world leader in the new knowledge economy”, setting up a government office, the Office of the e-Envoy, to lead “the drive to get the UK online” (Cabinet Office 2003). The then Chancellor of the Exchequer, Gordon Brown, noted concern that “(a)nyone left out of the new knowledge revolution will be left behind in the new knowledge economy” (quoted in (Shearman 1999, p. 3)). Regeneration policy discourse and practices began to incorporate consideration of ICT technologies within their strategies, believing that to do so would secure some form of competitive advantage (Gibbs and Tanner 1997; Dabinett 2000). The prime minister, Tony Blair, declared that he wanted to ensure “universal access” by 2005 (Cabinet Office 2000) and in 2005 a UK Digital Strategy document declared universal local access “by 2008” (Cabinet Office 2005).

Academic research interest also continued to grow in the 1990s considering the impact of ICTs within geographical communities, leading to academic conferences and more in-depth studies. For example, in 1994 the ‘Ties that bind: building community networks’ conference was held by the Morino Institute and Apple Computers (Cisler 1994), and the RAND Corporation undertook a study of five US community networks in 1995 (Anderson, Bikson et al. 1995), including Doug Schuler’s Seattle Community Network, the MIT supported Playing to Win Network, and the Virginia Tech driven Blacksburg Electronic Village (BEV). University research funded a range of ICT community initiatives, and influenced political discourse.

It is clear that there are a broad range of interpretations of what ‘universal access’ entails, and what a meaningful level of connectivity represents. I will first discuss how access has been interpreted.

2.1.2 What is digital access?

Digital access was originally defined as the possession of physical access to the equipment required for an internet connection: a cable connection of some description (usually a telephone line) and the appropriate terminal devices (usually a modem and computer). This was shaped by the NTIA’s original focus of studying universal telephone access, and has influenced the discourse regarding the digital divide ever since (Dutton, Gillett et al. 2004), leading to an emphasis on network infrastructure which overshadows other equally significant aspects of connectivity (Gillett 2000; Evans 2002). The NTIA report provided two simple markers of connectivity, the device, and the conduit. When these are attained, some researchers consider digital access to have been achieved.

The device model of digital access equates being online to the ownership or availability of the device required: an internet-ready computer. Researchers such as Thierer (2000) and Compaigne (2001) have focussed on this as the key element of the divide. The conduit model identifies the channel of communication as the key to overcoming the divide; as well as the physical device, the user also requires access to a supply channel, providing service on a regular basis (Phipps 2000; Warschauer 2002). This latter consideration brings in the understanding that access must be sustained over time: the metaphor of “crossing the digital divide” is faulty for

implying that a single action can be undertaken as ongoing action is needed to assure the individual stays across the divide. These models still greatly influence government funded initiatives. The UK government's largest pilot study of connecting communities was chiefly concerned with identifying the most appropriate conduit to supply to communities (a dial-up telephone connection or ADSL¹ broadband connection) and the best device (new or recycled personal computers, or set-top boxes) for users (Devins, Darlow et al. 2003).

The NTIA reports (1995; 1998) identified access to computers as synonymous with personal ownership. However, the cost of purchasing a computer and subscribing to an internet connection has meant universal access has not been achieved as quickly as technological optimists may have hoped (Thierer 2000; Compaine 2001). A variety of initiatives have therefore developed to support access, and later (Section 2.3 and 2.6, following) I will examine examples in greater detail. Early responses by policymakers were chiefly focussed on providing neighbourhood computing facilities, sometimes referred to as 'community technology centres' (Qvortrup 1994; Pinkett 2000d; Turner and Pinkett 2000). The UK government, for example, invested resources in 'UK online centres' which are branded facilities in existing community meeting points such as schools, libraries, and council buildings (<http://www.dfes.gov.uk/ukonlinecentres/>). The project website declared that "(t)he overall objective of UK online centres is to enable everyone in the UK that wants to have access to the internet and e-mail (will have it) near to where they live". However "near" is somewhat ambiguous, and it is not clear as to what distance people will have to travel to gain access to the computing facilities.

¹ ADSL: Asymmetric Digital Subscriber Line

In some localities those who wish to get connected and are financially able to do so may not be able to because the telecommunications infrastructure is not in place. This has led to a variety of alternative approaches to achieving connectivity where the national telecoms providers are not able to, or choose not to provide services (Section 2.6, following). Example groups include the Community Broadband Network (<http://www.broadband-uk.coop/>), concerned with rural access, and urban wireless networks such as Seattle Wireless (<http://www.seattlewireless.net/>).

Even if computer access is achievable through local resources such as a computer technology centre, this may only constitute *formal* access to digital resources but not *effective* access: the concept of access is multifaceted (Wilson 2000). There may be cultural or social reasons for not using a neighbourhood facility (Day and Harris 1997). For example in one UK community technology centre the local internet access point was situated within the local Miners Welfare Club, physically accessible to all, but the building and its general purposes (supporting local coal miners and ex-miners) had been of central community importance during a recent national miners strike and hence the building itself was highly symbolic and polarised opinions: certain sections of the community would not use the building because of its association with events (Devins, Darlow et al. 2003).

However, achieving physical access clearly does not equate to crossing all the boundaries of the digital divide and a more finely expressed model of connectivity must be considered (Pinkett 2000d; Gunkel 2003; van Dijk and Hacker 2003). Beyond 'access' there are further issues to consider.

2.1.3 From digital divide towards multiple insufficiencies

As internet penetration increases and more longitudinal data becomes available, researchers have developed more complex models to describe people's levels of connectivity. An Oxford Internet Survey (Dutton, di Gennaro et al. 2005) suggests that 61% of the UK population have internet access at home, and researchers suggest focus should be turned from exploring a simple binary divide between those online and offline to differential levels of access, and types of usage (Loader and Keeble 2004). It is clear it is too simplistic to talk of a dichotomous digital divide, rather there is a more complex picture of inequalities, or perhaps a better term might be insufficiencies. Rather than trying to provide equality of connectivity, we should look at ensuring different people's needs are met appropriately rather than homogeneously.

Clement and Shade's 'Access Rainbow' (2000) posits different levels of access. This model identifies seven layers of potential access, leading from physical infrastructure ("carriage facilities") and building up to questions of governance.

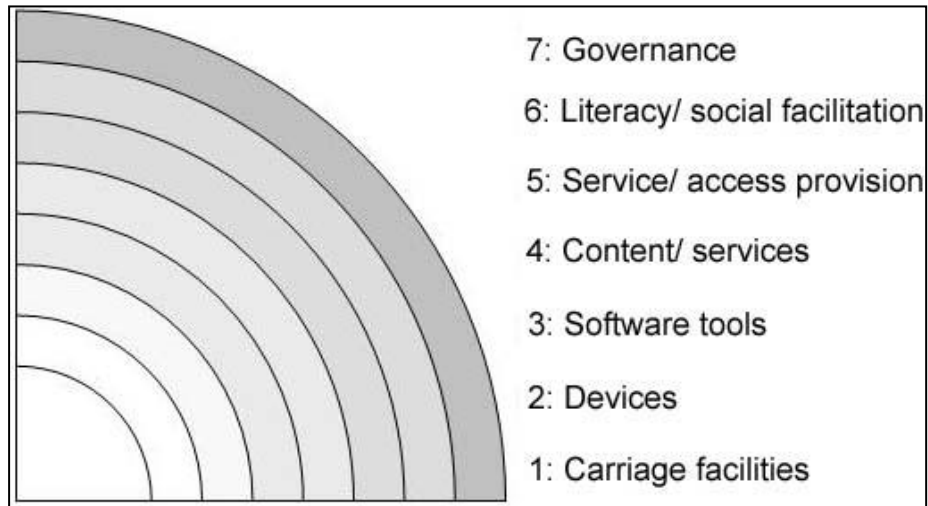


Figure 2-1: The Access Rainbow (after Clement and Shade (2000))

The seven layers proposed are:

1. Carriage: the infrastructure for transporting the data
2. Devices: the computers and other devices used by the individual
3. Software tools: the browser, email program and other software needed to use the internet
4. Content/services: online databases and website repositories of information; email and e-commerce services
5. Service/access provision: local ISPs and community access points
6. Literacy/ social facilitation: text and computer literacy; training and support services
7. Governance: public consultation on policy issues; social impact assessments

This model adds technological and social layers to the device and conduit models.

Clement and Shade propose that there is more to connectivity than simply assuring a physical connection. DiMaggio and Hargittai (2001) contend that as internet

penetration increases, we should shift our attention to differing inequalities between people who have achieved access. Their research identifies that amongst people who have access, there are varying degrees of actual usage. In order to understand the differing rates of usage, DiMaggio and Hargittai identify five forms of inequality:

- Technical
- Autonomy
- Skill
- Social support
- Purpose

Technical inequality refers to differing levels of access to hardware and connections. Slow, out of date or virus infected computers perform poorly and may lead to disillusionment (Day and Harris 1997) and internet connections can be of greatly differing levels of performance and cost (Hoag 1997). Davison and Cotton (2003) suggest that the type of connection may be a more significant inequality than all others. The cost of computer equipment and an internet connection is likely to remain a significant barrier for some time (NTIA 2002). A network connection and personal computer are additional purchases which have to be justified in addition to existing commitments such as television, mobile phones and cable TV (Owen, Green et al. 2003). Internet access is generally perceived as a supplementary rather than supplanting technology; people will use it in addition to a telephone and the television, rather than replacing these costs. Internet technologies are rapidly evolving and frequent hardware and software upgrades are required; making repeat purchases necessary. The cost of ownership is not just a single purchase of a

hardware device, but includes software, hardware, updates, planning, and training (Warschauer 2002).

This offers a less optimistic view than Compaine's assertions (2001) that the divide will be crossed as the technology becomes more affordable, and that internet take up will follow Rogers' model for the diffusion of innovations (Rogers 1962). Rogers described the take up of innovations diffusing across a population as a bell curve, moving initially from a small number of 'innovators', who will be the first to seize a new technology, through to a larger number of 'early adopters' and in increasing numbers to the majority of the population, and finally to diminishing numbers of 'laggards' who will be last to take up the innovation. However Rogers' model may not encompass a whole population: even in his studies of agricultural innovation he noted there might be some non-adopters. The laggards and non-adopters fear of obsolescence – that the cost of buying into an innovation may be greater than its useful life and utility - has proved to be valid regarding personal computers (Brown and Venkatesh 2003), and it is likely this will be equally applicable to online connectivity.

DiMaggio and Hargittai's second form of inequality is the level of user autonomy to interact with the technology. Having physical access to an internet connected computer does not necessarily mean free use of that connection (DiMaggio and Hargittai 2001). Personal use may not be permitted on a workplace connection, and a home computer may not be available equally to all members of the household (Kraut, Scherlis et al. 1996; DiMaggio and Hargittai 2001; Evans 2002). Telecentres, "multi-purpose centres aimed at providing computers and telecom facilities and support for

local communities” (Qvortrup 1994) offer a central resource within a locality but may limit access in terms of opening hours and what services are available. Some locations may not allow users to play games or save work onto their own memory devices, and there might be security issues associated with entering personal credit card details onto public machines when purchasing items online.

Users must have sufficient skills to gain benefits from their access to the computer. As more people gain access, the level of their abilities becomes a more significant issue and a key barrier to potential digital inclusion (Commission of the European Communities 2005). The value that a user can gain from their access to the Internet is dependent on their abilities to find and evaluate the information they seek. Wilson (2000) refers to inequality in “cognitive access”, the extent to which users are trained to find and evaluate the information they seek, while van Dijk and Hacker (2003) suggest three levels of digital skills: instrumental, informational, and strategic.

Instrumental skills are the ability to operate the hardware and software, to use the actual physical devices, and to understand how the software functions. To use the internet, an individual must be happy to switch on the computer, use a keyboard and mouse, and understand how a web browser works. *Information skills* are required to search for information: to understand how to use the functionality of software to formulate queries and to gather information: for example being able to formulate searches when using search engines or negotiate online payment systems. *Strategic skills* are then required to make use of information for one’s own purpose; to make sense of what information has been gathered, how to manipulate it, and how to apply it.

Taken together, these skills may create what DiMaggio and Hargittai call ‘internet competence’. Warschauer (2002) suggests ‘digital literacy’ as a better reconceptualisation than ‘divide’, suggesting the analogy with written literacy as a gathering of skills and abilities developed within a social setting. The Bertelsmann Foundation describe technological literacy as one of several essential literacies of the twenty-first century (Bertelsmann Foundation and AOL Time Warner 2002). However, the internet is rapidly changing, and unlike learning to use the telephone or reading, skills learnt will not suffice the user for their lifetime. Internet users must continually re-cross the digital divide.

It is important therefore that the user is able to learn new skills and improve old ones, hence social support is another of DiMaggio and Hargittai’s concerns. This is required both formally by learners from experts, and informally from peers within a community. Non-users consistently report being deterred from ICT because of its perceived complexity. Unlike the workplace, the home user does not have automatic access to support (Kraut, Scherlis et al. 1996; Edwards and Grinter 2001; Norman 2003). Uptake and further use may be significantly affected by the amount of social support a user has access to on a day-to-day basis. New users need to be able to draw on social contacts to increase their skill levels and help gain confidence, and have access to emotional support and encouragement when they encounter problems. The perceived complexity of computers and the internet deters individuals who are wary of new technologies and without support they are unlikely to persevere in the face of problems (Green 2006). Warschauer (2002) suggests that users must participate within a social setting: ‘digital literacy’ is a social practice, involving access to

physical artefacts, content, skills, and social support. Wyatt et al. suggest the value of a “warm expert” – somebody already known within the community who can also provide expert domain advice, for example a family member or a friend (Wyatt, Allison et al. 2003). The social environment may resolve the lack of formal support mechanisms (Hafner 2003) and help users to maintain their skills set in the complex and rapidly changing technical environment (van Dijk and Hacker 2003). Shaw, referring to the theory of social constructionism, states that “individual developmental cycles are enhanced by shared constructive activity in the social setting” (Shaw 1995): the user is supported by developing their knowledge within a community setting, gaining access to community feedback that can help them reinterpret and develop their experiences. Additionally, learning within the community can in turn support the community itself, building social capital between residents (Foth 2005). Ferlander (2003) suggests that informal support of technology within a community can foster the development of intergenerational integration, a view mirrored by the HomeNet study which suggested the need for support elevates the value of teenagers within a household as they often become the local ‘technical guru’ (Kiesler, Zdaniuk et al. 2000). In turn, the withdrawal of support can lead to the collapse of ICT usage (Jæger 2001).

Finally, DiMaggio and Hargittai’s fifth dimension of inequality is purpose. People need a reason to be connected, and merely having access does not mean they will necessarily want to use internet services, and ‘cross the digital divide’ if there is no benefit for them. Cross (2005) notes “(t)he success of digital television and mobile phones shows that people will go digital when there is something in it for them”, however, without a purpose there is no reason for people to “go digital”. Many

researchers have noted the lack of local content to engage community users, and view this as essential (Pinkett 2003; Tharp and Dekkers 2003). As internet access becomes more ubiquitous, it is becoming clear there are categories of those who are not online: as well as the “truly disconnected” who are unable to gain access, there are also “net evaders” who don’t see the relevance of ICT usage to their everyday lives and “net dropouts” who have been online and no longer are for a variety of reasons (Lenhart, Horrigan et al. 2003). Pew Internet Life suggests that the number of “truly disconnected” US citizens has remained stable at approximately 20% since 2002 (Fox 2005), so non-use cannot be explained only by lack of access; personal choice plays a significant role and will need to be addressed in the future. This is echoed by a BT study forecasting the UK digital divide in 2025; it is not simply a case of everybody moving online as young people grow up with computers: the “digitally disengaged” must be considered (British Telecom 2004). 46% of UK non-users (Cabinet Office 2005) and nearly 30% of non-users in the EU 25 countries cited “lack of interest” as their reason for not accessing the internet (Commission of the European Communities 2005). If ICT initiatives are to engage they must provide tools and content that are relevant to users’ needs.

2.1.4 Active users rather than passive receivers

A key concern about the metaphor of the ‘digital divide’ is the focus on treating people as passive recipients rather than active users engaging with technology. For example, the UK government’s policy action team responsible for looking at the role of information technology in the renewal of neighbourhoods (PAT15) talked of “encouraging people to use modern information communication technologies”

(PAT15 2000). Evans (2002) argues that the introduction of ICT for community benefit has largely reflected a supply-led push of computing into communities, rather than a demand-led pull. The expression 'digital divide' itself suggests a 'digital solution' and the need for mediation to help people across. However, government and other high level funded projects may fail because they are large scale interventions and may not involve the end users in the design process (Pinkett 2000b; Warschauer 2002). If the content is seen as irrelevant, users will have little reason to want to participate (Pinkett 2000c; Evans 2002; Owen, Green et al. 2003). In some cases, users may become disillusioned and cease to use ICT altogether (Wyatt 1999; Brown and Venkatesh 2003; Pew 2003).

A more user-orientated model is required, developed from users' needs. Fischer (2002) has argued that people need to be included in the design process, as active designers "rather than couch potatoes". Mäkinen echoes Warschauer's description of ICT as tools for social inclusion by referring to 'participatory inclusion'. ICT can empower individuals and communities if they are placed at the centre of the model as active agents. "People are actively engaged when they are participating and creating something that is meaningful ... for them" (Mäkinen 2004, p.2). More recent models exploring how individuals interact are considering their activities; for example whether they use ICTs for entertainment, shopping, exploring or their work, or whether they are unengaged, reject or are marginalised by the technologies (Longley 2006).

DiMaggio and Hargittai's exploration shows that there are multiple barriers to connectivity, and formal access is just one aspect. It is clear that the barriers must be

crossed and re-crossed – this is not just a single journey but an ongoing engagement with challenges; as van Dijk and Hacker point out skills must be relearned, and as Day notes, equipment gets old and must be replaced. The ‘digital divide’ needs to be continually addressed, not just at one moment in time.

DiMaggio and Hargittai’s exploration is focussed on the individual, however they touch on the benefits that an individual gains from collaborating within a group to overcome and continually challenge barriers. As other authors have noted, approaching the challenges within a community offers the opportunity to share others experience and skills, and benefit from mutual support. By its very nature, engagement with ICTs as a communication tool implies group interaction, and it may be that this is the most effective method of overcoming barriers.

This is reflected in the concept of an emerging ‘network society’ (van Dijk 1999), a society where individuals are linked to each other and information resources constantly, in the workplace and at home by information technology networks. Castells sees an information technology revolution, where the sharing of ideas and information over these networks shapes the organisational forms and structures of our society, with key social, political and cultural structures negotiated and defined via this new means of communication (Castells 1996). To overcome the digital divide, in this discourse, is to be able to participate in such a networked society.

Community informatics, the approach in which this thesis is situated, is interested in considering how ICTs can be used to not only empower individuals within such a networked society, but to develop, regenerate, and sustain communities (Keeble and Loader 2001). While the network society may focus on connecting individuals

together via technology mediated networks, the community informatics approach is to consider information technology acting as the “carrier and the facilitator of the connections either or both between communities or within communities” to help them reach their goals (Gurstein 2007, p. 17).

A community based approach offers not only social support, but shared purpose. Such an approach may not only solve some of the problems encountered, but building community interaction and empowering a local group may be an important reason to engage with the technology in the first place.

However, the definition of community itself is much contested and I now turn to examine research into the meaning of ‘community’.

2.2 Considering community

Community is such an integral part of everyday language and thinking that reference to it tends to pass with little comment. This section seeks to briefly analyse the meaning of community, why the advent of new communications technologies may strengthen rather than weaken its importance and appeal, and understand why sense of place is still a significant factor in human relations.

2.2.1 The problem of defining community

The concept of community as a spatially bound locality, where relationships are based upon strong personal attachments, has been widely drawn upon since the

beginning of history; for example Plato proposes the ideal community in *The Laws* (Plato trans. Saunders, T., 1973). The traditional, rural ideal of the bucolic village with relationships stretching back many generations was used in the nineteenth century as a critique against the developing industrialisation of society, and the accompanying social and geographical upheavals (Hughes 1998).

Notable amongst social theorists of this time was Ferdinand Tönnies (Tönnies 1887, trans. Loomis, C. 1957) who drew a distinction between two types of social organisation. Tönnies argued that *Gemeinschaft* or community was dominated by primary social group bonds: family, kin and face to face contact. He saw this as the traditional image of society, whereas *Gesellschaft*, or society, referred to relations based on society, work-defined association and more transitory, anonymous and contractual relations. These contrasting relations were linked with settlement patterns, and as the rural traditional life had passed, so new forms of community and society were being shaped. People were undergoing a paradigm shift in the way they connected with one another, and workplace relationships were becoming as significant as the home. Community was not just about locality but also a wider network of relations. This struggle with the changing definition of community, often associated with the power of transportation and communication technologies has vexed researchers since the nineteenth century to the present. Both the telephone (Fischer 1992) and the telegraph (Standage 1999) were seen as disruptive and socially threatening communication technologies by contemporary writers as they began to affect how people interacted.

What then is community? The Oxford English Dictionary offers nine definitions, including “life in association with others” (OED 1989). The term is used broadly, and casually, but often refers to a group of people with something in common (Hill 1994), or identifying with place: a space based locality (Hughes 1998). Perhaps the reason why it is difficult to define is that it allows so many possibilities: Hillery (1955) identified 94 definitions of community, with the only link between them being that “all of the definitions deal with people”. Often framed within an emotional appeal to both an imagined past and to an idyllic future (Worsley 1987), it is nevertheless clear that the term is powerful and hence needs framing if we are to use it in any meaningful way. However its flexibility could also be its strength. Within a multidisciplinary exploration such as this thesis, it is a term that bridges many fields and draws together various areas of research.

2.2.2 Three types of community

Willmott (1986, pp.83-84) defined three types of community:

- Community of place, or locality: defined by where we live, our neighbourhood
- Community of attachment: a measure of the level of interaction with others, and the sense of identity
- Community of interest: a group of people with common interest

Crow and Allen (1994) note that the mythical “sense of community” is likely to be strongest when two of three of Willmott’s types of community are present. I will now turn to examine each of these definitions.

2.2.2.1 Communities of locality

Willmott’s first definition is the community of place, or locality: the local neighbourhood. Place implies physical boundaries and the definition of the community by geography. Most people start with their immediate neighbourhood (Young and Willmott 1957; Willmott 1989; Pinkett 2000d): their block of flats, or housing estate, “people living in or near the same road/flats as yourself” (Willmott 1986). The notion of a larger neighbourhood is also common, containing maybe several thousand people, within which individuals can functionally survive and access most of the ‘local’ services they may need, such as shops, banks, and leisure facilities. The UK government’s pilot network connectivity project ‘Wired Up Communities’ used this notion as its starting definition for community: “those living in relative proximity and made up of no more than 4000 people” (Devins, Darlow et al. 2003). The term can be stretched further, to one’s town, region, nationhood and even a group of nations such as ‘the European Community’ (Gellner 1983) but it is clear that at some point the definition becomes too tenuous. The phrase is more comfortably applied at a more local level, and often used as a synonym for one’s own immediate neighbourhood.

Consensus of what defines the local community can often be achieved by considering boundaries, for example asking people to describe the boundary markers

of their neighbourhood. These are usually physical artefacts such as large roads, rivers, or specific buildings, alternatively they may be socially or politically defined divisions such as church parishes or council boroughs (Willmott 1986). Another limiting factor on the size of a place-based community may be the constituent population. Dunbar (1993) suggested that humans may have a cognitive limit of approximately 150 people with whom an individual can maintain stable relationships. Amish farming communities in the USA are an example; consciously dividing and forming new settlements on reaching near to this population size (Gray 2000). This leads us to Willmott's second definition of community: who you feel emotionally related to, a community of attachment.

2.2.2.2 Communities of attachment

A community of attachment is who you know and identify as friend or family, independent of geographical locality. This refers to emotional ties between individuals, the forms of collective association and action that take place between individuals (Reed 2003), the community of shared identity. Communities of attachment may also go beyond people to include non-human elements, such as religious or linguistic territories, or historical ties to places: "(t)hey may be thought of, rather, as existing in the minds of the beholders" (Cohn 1985, p.12).

A community of attachment necessitates social interaction. Such social interaction can develop a reserve of emotional obligations and mutual support through ongoing participation, contact with others (Green, Grimsley et al. 2005) and the nurturing of trust (Fukuyama 1996). This can be referred to as 'social capital', the social

equivalent of trade and business creating financial capital. Social capital can be defined as “the level of productive investment in social relations” ((Warren 2001) quoted in (Grimsley, Meehan et al. 2003)), or “access to social resources” (Lin 2001). Social capital eases transactions and can help individuals achieve unrelated goals (van der Gaag and Snijders 2003).

Discussion of social capital is not new; in 1916 L.J. Hanifan used the expression to urge community involvement in schools (Hanifan 1916). His work has been referred to by Robert Putnam, who has brought the discussion of social capital to prominence in the last decade with regard to his concerns over the deterioration of community interaction through formal associations in the USA (Putnam 2000). Putnam divides social relationships broadly into two types: the strong social ties between family, close friends and associates, “bonding social capital”, and the weaker, extended ties between different social groups, “bridging social capital” (Putnam 2000). Bonding social capital is ‘exclusive’ and reinforces membership within a specific group. This enables a group to function cohesively, bypassing or enhancing other forms of capital; for example through sharing of skills and information, reciprocal favours, or voluntary activities to mutually improve the common environment. A high level of bonding social capital is generally seen as a positive attribute of a healthy neighbourhood, enabling support of individuals and the development of a community. Excessive levels, however, can be negative, reducing tolerance of outsiders, stifling innovation, supporting unhealthy norms, and causing people to reject alternatives (Durlauf 1999; Cavaye 2004). Within a communitarian perspective, however, the presence of strong bonding capital is considered to outweigh the negative possibilities.

Bridging social capital on the other hand is inclusive, linking separate communities. According to Stone and Hughes, “bridging social capital involves overlapping networks in which a member of one group can gain access to the resources of another group because of overlapping membership” (Stone and Hughes 2001). These links extend a community’s reach by opening up contacts to different individuals and organisations that may offer opportunities or facilities not available within the local community.

Bonding social capital helps people to ‘get by’, while bridging capital helps people ‘get ahead’. Stone and Hughes argue that a balance of bonding and bridging community is required to ensure community sustainability: a strong close social circle is important but also "a tolerance of diversity" and a willingness “to forge cooperative relations with outsiders”. Bridging social capital can itself be divided between ‘intra-community’ bridging (local community ties) and ‘intercommunity’ bridging (ties across the ‘borders’ of local communities). Sometimes the latter is referred to as ‘linking’ social capital (Healy, Ayres et al. 2003) and has been considered useful when attempting to understand the role of social capital in communities facing rapid change. However, other researchers have debated whether this is a separate form of bridging capital (Western, Stimson et al. 2005). Bridging capital may also be subjected to interrogation, to deduce as to whether it provides ‘lateral’ bridging between equal partners (e.g. neighbouring residents groups) or ‘vertical’ bridging between more and less influential groups (e.g. the city council and a local residents' group).

Researchers have referred to these concepts in a variety of terms – Granovetter for example referred to “strong ties” and “weak ties” in a similar manner to ‘bonding’ and bridging’ social capital (Granovetter 1973). Granovetter noted the importance of ‘weak ties’ when seeking employment: the ability for individuals to bridge their social circle and communicate with other groups who may require their services.

Social capital is a convenient shorthand for describing the reciprocal relationships that help individuals extend their reach within a community or communities, indeed some researchers go as far as to describe it as the glue that holds other forms of capital together ((Grootaert 1998) quoted in (Grimsley, Meehan et al. 2003)). It is possible for people to live in the same area without feeling any emotional ties to one another, and this forms the basis for debate on the idea of ‘lost community’ or ‘dormitory towns’ – places we inhabit but have little attachment to. Communities of locality have become less socially significant with the development of transportation technologies and may continue to decline as information technologies develop (Wellman, Quan-Haase et al. 2003). As our social circles widen it becomes easier to choose whether or not to participate in our community of place, and instead turn more to communities of attachment. The clear division of locality and attachment highlights an important point: that community is always imagined (Anderson 1983). Communities are not fixed, but defined, discussed, and redefined throughout time.

2.2.2.3 Communities of interest

The third definition Willmott offers is that of a community of interest: a group of people sharing and meeting to pursue similar interests. These can be religious,

political, based on hobbies, or shared work associations. Some would argue that this is one of the most significant forms of community (Putnam 2000) and can produce high levels of social capital. Communities of interest can be loose agreements or more structured organisations: a group of people talking over the internet about football, a church group debating the nature of God or a national environmental organisation discussing climate change. This form of community does not require the participating individuals to share the same geographical locality, but merely communicate their shared interest in a knowledge domain.

A more formal type of community of interest can be described as a community of practice. Originally defined by Jean Lave and Etienne Wenger (Lave and Wenger 1991), the core concept is of a group of members brought together by a shared (usually professional) practice. The community is likely to have drawn together informally to share expertise and support, maybe from across different organisations or professions. A classic example is photocopying technicians meeting for breakfast in local cafes to talk “war stories” (day-to-day work experiences) and help solve each other’s problems (Orr 1996).

According to Wenger (1998), a community of practice defines itself along three dimensions:

1. What it is about – its joint enterprise as understood and continually renegotiated by its members
2. How it functions - mutual engagement that bind members together into a social entity

3. What capability it has produced – the shared repertoire of communal resources (routines, sensibilities, artefacts, vocabulary, styles, etc.) that members have developed over time

Crucial to the idea of communities of practice is the idea that its members have roles to play within the community. Starting at the periphery, members gather knowledge from the more central, experienced practitioners, and thus learn how to participate fully within the community, gaining experience. Lave and Wenger refer to this as situated learning – participating within the environment, first as an apprentice, and gradually developing experience, moving in from the periphery to full participation as an experienced practitioner. However it has been argued that one of the problems of the idea of communities of practice is that it offers a much idealised view of group activity, focussing on movement from novice to expert (Ross 2003) and transfer of knowledge in the reverse direction.

The development of ICT has led to the development of specific tools to facilitate work-based communities of practice and interest: Computer Supported Collaborative Work tools (CSCW) and Computer Mediated Communication (CMC) such as discussion boards, email, and other shared virtual spaces. The development of these tools (discussed further in Section 2.7) has aimed to offer more communication channels between members of the communities, facilitating a richer transference of knowledge, and increasing social capital. Such tools are now capable of sustaining purely “virtual communities” (Evans 2002; Tanabe, van den Besselaar et al. 2002), where all interaction occurs in a ‘virtual’ (computer mediated) space.

2.2.3 Virtual communities

The idea of virtual communities has existed as long as networked computers (Licklider and Taylor 1968; Hafner and Lyon 1998), and entered widespread parlance with Howard Rheingold's book, "The virtual community: homesteading on the virtual frontier" (Rheingold 1994). Technological evangelists have long enthused that the internet would remove the limitations of geography (Mitchell 1996) and cause the "death of distance" (Cairncross 1997). No longer would people have to meet up, and most communicating could take place in virtual worlds. It is possible to develop communities that are purely virtual, to discuss computer networks as social networks establishing their own norms and structures (Wellman 1996) and to use ICT to support geographically disparate communities based on practice or interest. ICT and network based tools have moved from laboratory to workplace, and now into social environments, such as games (Pargman 2000; Steinkuehler and Williams 2006). Tanabe et al. (2002) have identified a diversity of approaches to virtual community spaces and suggest that the concept of 'ICT tools as spaces' takes one of three forms:

1. A system using a place metaphor: a virtual community that uses the metaphor and visual interface of a physical place.

Originally intended to create immersive, realistic virtual locations where people could meet and communicate represented by simulated characters (avatars). Early experiments focussed upon creating replacement workplace environments, and virtual tour guides of real locations. With the domestic

availability of high specification computers and faster network bandwidth it is now possible to create massively multiplayer online games where users meet and interact in virtual worlds, such as Everquest Online², World of Warcraft³, or Second Life⁴.

2. The representation of a real physical community: offering information about the locality

Users are presented with a central website where they can find out about their locality: what's happening, the doctor's opening hours, the telephone number of their councillors and so forth. Some level of interaction may be enabled, such as a discussion board to allow discussion on topics of interest relating to the locality. An early example of this was Amsterdam's Digital City⁵, originating in the early 1990s, and the concept of a neighbourhood website for towns and villages has spread globally with a wide range of local government, commercial, and grassroots approaches.

3. A community with advanced infrastructure: developing the physical infrastructure of a geographical area with the intent of revitalising the economy or to increase usage of technology.

Here the focus is not only upon creating a virtual space but also developing the infrastructure of a real locality. Consideration of the network

² <http://everquest.station.sony.com/>

³ <http://www.worldofwarcraft.com/>

⁴ <http://secondlife.com/>

⁵ <http://www.dds.nl>

infrastructure is an important aspect with emphasis placed on ensuring universal access to Internet services is as much as building a shared online resource. The infrastructure itself is designed to represent a 'virtual community', though it is likely that such an infrastructure will also have additional functionalities. It may be for a specific community of practice such as Sohonet⁶, providing a network infrastructure for London media production companies, or more usually a community of locality such as Ennis Information Age Town (McQuillan 2006) or Manchester's Redbricks Online (Skyva 2002).

Evans (2002) suggests four models of virtual community using place as a metaphor mapping broadly to Tanabe's three concepts, however Evans is more specific about the services offered and the nature of the access. While some authors have debated whether virtual communities are 'true' communities (Driskell and Lyon 2002), Evans notes that a 'virtual community' is of little use unless there members have access and grounds the concept of virtual community in locality, reflecting Willmott's observation that "local community undoubtedly matters in the lives of the great majority of people" (Willmott 1986). Evans focuses on introducing ICT into low income neighbourhoods, and a central point of access is seen as a solution to providing connectivity. This is echoed in Pinkett and Turner's work in low income communities in the USA (Pinkett 2000a; Turner and Pinkett 2000) which was noted by Tanabe et al. as examples of community infrastructure building.

⁶ <http://www.sohonet.co.uk>

Within this thesis, I will follow Evans approach, and consider virtual communities grounded within place, that I have elsewhere described as “hybrid communities” (Gaved and Mulholland 2005a). Members of hybrid communities interact both in virtual and physical space, utilising a combination of both ICT mediated and more traditional forms of communication within a personal “ecology of communication” (Altheide 1994), applying tools as they appear most appropriate.

This approach draws in two of the Propositions raised at the beginning of this dissertation; that bringing people online as part of a community, rather than individuals, may prove to be a more effective and sustainable means of overcoming the digital divide (Proposition 1) and that appropriate social software – tools developed for virtual communities - may enhance participation within such a hybrid community (Proposition 3).

2.3 Community approaches to overcoming the digital divide

Section 2.1.4 of the literature review described how active participation is required for a meaningful crossing of the digital divide. Rather than a simple binary divide, a more complex set of insufficiencies need to be overcome, and these must be readdressed on a regular basis; an analogy with universal telephone access does not hold true (Lievrouw 2000). For ICT to become a technology of social inclusion (Warschauer 2002) users must become active participants rather than passive recipients. It is important to identify a model to nurture ‘participatory inclusion’ (Mäkinen 2003).

In this research I offer the proposition that a community based approach is an appropriate response and may offer a successful method of overcoming the digital divide. Such an approach brings with it the benefits of existing social relationships, support, and a wider basis of potential knowledge and expertise (Kavanaugh and Patterson 2001). In turn, a digital network can strengthen an existing community by offering additional affordances and functionalities (Hampton and Wellman 2003; Wellman, Quan-Haase et al. 2003). Internet use can support increased engagement in the community (Arnold 2000), build social capital (Wellman and Gulia 1999; Commission of the European Communities 2005) and overcome barriers of time (Klein 1999) as well as distance (Mitchell 1996). Research on internet usage suggests that usage adapts to existing patterns of society rather than creating new forms (Agre 1999; DiMaggio, Hargittai et al. 2001). While defining community is difficult, it is widely understood by most people (Loader, Hague et al. 2000; McQuillan 2006). Using DiMaggio and Hargittai's five categories of digital inequalities (2001) as a framework, we can investigate how an existing community can support the crossing of a digital divide.

2.3.1 Technical

At the simplest level of community networking an existing neighbourhood has the ability to aggregate purchasing power (Wilcox, Greenop et al. 2002). Members of a community can band together to access or purchase hardware, software, and network connectivity. For several years in the UK, BT (the national telecom provider) put a 'trigger point' on providing broadband access, requiring a minimum number of people to sign up before enabling the local telephone exchange. Grassroots

community action could help aggregate this demand (Hubbard 2003) and was a method of achieving local connectivity in lower populated areas. More recently, BT has enforced a similar process for upgrading local networks to fibre optic connection (the 'Path to Infinity' project). Making use of existing social ties allows people to gain access to equipment, sharing often expensive equipment across neighbourhoods. Technical support can be provided within the neighbourhood: unlike workplace communities, where there is a technical support department, people have to become their own experts and community members can support each other to overcome technical barriers (Kiesler, Zdaniuk et al. 2000; Cochrane 2003).

2.3.2 Autonomy

Formal access to the internet through a workplace or education connection may not provide effective access (Hargittai 2002) with the time and nature of the access proscribed to within particular limits (Hargittai 2003). Access at home enables users to experiment more and increase their skills. A network connection provided through a community initiative will actively promote social use of the facility (Hellawell and Mulquin 2001) and encourage members of the community to explore the possibilities rather than impose restrictions on access. Networks developed within communities actively attempt to encourage all members to make use of the network as they wish, rather than limit its use to defined tasks (Hargittai 2002).

2.3.3 Skill

Communities have a basis of shared skills that can be accessed to help individuals move online. Leveraging existing social relationships – social capital – can allow individuals' access to local experts (Putnam 2000). One of the greatest criticisms of networked technologies is their complexity of use and maintenance (Hafner 2003; Norman 2003) and the existence of strong social ties allows the complexity to be spread amongst members of the community (Kiesler, Zdaniuk et al. 2000; Kavanaugh 2001a). A personal computer and its peripherals are often perceived as a “delicate ecosystem” (Crabtree and Roberts 2002) and going online is often viewed with concern in case the ecosystem may be disrupted. Novice users are able to learn from and be supported by local experts, learning through their engagement with neighbours, effectively a “community of practice” (Lave and Wenger 1991). The community offers the opportunity of skills transference from ‘experts’ to ‘apprentices’.

2.3.4 Social support

The essence of a community of locality is the social ties that make it distinct from a disparate group of individuals inhabiting a place. Bringing individuals online as part of a community enables them to benefit from the strong social ties they have already developed, and to leverage the benefits held in this social capital (Putnam 2000). Kavanagh (2001a) studying the Blacksburg Electronic Village, notes that the social network extant within a community offers critical support in the diffusion of a

community network in two ways: innovation, and sustainability. Innovation diffuses through the community from champions, and early adopters, who are already known and trusted. These individuals can support the development of the late majority within the community. Sustainability is achieved by using existing social capital to help support the development of online resources, and spread the burden between members of a community; the network project is seen as another aspect of the community identity. Active members can mobilise contributing resources and use social capital (voluntary work) to overcome scarcity of financial resources (Kavanaugh 2001a).

2.3.5 Purpose

Coming online as part of a community brings with it a purpose: the desire to interact with existing contacts. While ‘virtual communities’ need to invest time to create common ground between their members (Millen and Patterson 2003), an existing community which considers adding a virtual layer brings with it a network of strong and weak ties. Individuals moving online with the community benefit from an existing set of relationships that they are already integrated with via the new medium. An existing community already has a shared focus: maintenance and improvement of the shared space (Wilcox, Greenop et al. 2002). Moving online as part of a community can help increase the feeling of social inclusion (Warschauer 2002) and allow greater participation (Mäkinen 2003). The ‘virtual layer’ created by developing a community network to support an existing community can in turn benefit the community itself. Bringing individuals online as part of a community can benefit them in several ways; and in turn, “a pre-existing geographically defined

community can be reinforced and enhanced by use of the Internet” (Baker and Ward 2002).

2.4 Benefits of adding a virtual layer to a community

As individuals can benefit from approaching the digital divide as a community, so can communities themselves benefit from the development of a ‘virtual layer’ in a number of ways:

- Additional tools for enabling the community
- Development of relationships within the community
- Development of relationships external to the community

The first element is concerned with how a community is able to undertake its interactions, and the second and third are concerned with whom a community or its members can interact, echoing Putnam’s concepts of the development of bonding (inter-community) and bridging (intra-community) social capital (Putnam 2000).

2.4.1 Additional tools for enabling the community

A virtual layer can enhance an existing community by offering additional tools to support the community’s functions. Throughout history telecommunication innovations have been seen as potentially supporting or weakening communities: the concerns noted about the internet were raised with the introduction of the telegraph

(Standage 1999) and the telephone (Fischer 1992). However, rather than a simple cause and effect relationship as favoured by technological determinists, telecommunications innovations have a far more complex relationship with communities – technology has a complex recursive relationship with society (Bijker 1995).

Several researchers suggest that internet connectivity supplements rather than supplants existing modes of communication (Haythornthwaite 1999; Wellman and Gulia 1999; Hampton and Wellman 2003). While the time available to individuals is ‘zero-sum’ and any new activities displace existing activities, a network layer can offer additional functionalities to a community, helping bridge communications gaps between meetings. This has been described as “channel complementarity” (Dutta-Bergman 2004), and it has been noted that active members of a community will use additional channels of communication if they are available to better interact with their neighbours (Dutta-Bergman 2005). For example, mailing lists can allow members of the community to communicate a request to a large number of their neighbours, such as asking for help fixing a car, and a discussion board can enable people to catch up on issues discussed in meetings they could not attend. In order to sustain an active community it is imperative its members are able to interact and to participate in the decision making process. There are many barriers to participation however, such as the need to meet at a common place or time (Klein 1999) and communities can suffer as a result. Social software tools can provide supplementary means of communicating and storing information and knowledge within a community, and offer the opportunity for increased participation.

Community interaction can either be synchronous or asynchronous. Meetings have the advantage of gathering together many participants and allowing many-to-many interactions, as well as one-to-many. However, participation in face-to-face meetings is defined in time as well as space. A community can inform its members through one to many broadcast media such as noticeboards, newsletters, or letters. These are one to many tools and asynchronous in nature, and overcome geographical boundaries but are limited in their opportunity for receivers to respond or participate. Community members interested in the same topic may remain hidden from each other. Chance meetings and telephone calls are also possible, that allow one to one, synchronous communication. Email, listservs, discussion boards and chat tools can overcome the restrictions of distance, time, and ability to participate (Klein 1999).

Communities create and store information and knowledge, and its members need to be able to easily access this repository. Often this information will be held in a single place, and access limited to a particular time (when the office is open) or knowing who has the keys to the office cupboard. Social software tools offer the opportunity to make the information more readily available, outside these imposed limitations of time and place. Document repositories can potentially allow access from across the community at any time.

2.4.2 Development of relationships within the community

Social software tools can enhance a community by offering additional channels to develop social capital between members of the community. Haythornthwaite (1999) argues that strong ties are typified by communication across multiple media, and the

presence of additional media enhances existing ties (Hampton and Wellman 1999; Hampton and Wellman 2003). Early researchers were enthusiastic about the ability for ICT to transcend distance and enable individuals to move far beyond their immediate community (Licklider and Taylor 1968), however “much contact is between people who see each other and live locally” - communication via ICT has “filled in the gaps between in-person meetings” and enabled “arrangements for future get-togethers” (Wellman and Gulia 1999). Wellman and Hampton’s study of the ‘Netville’ connected community in Canada discovered that members of the community who were connected to the community network knew more people within the community: users recognised three times as many of their neighbours and spoke to twice as many as non-users (Wellman 2002).

2.4.3 Development of relationships external to the community

ICT can also help extend the reach of individuals and their community. Lille (1997) notes social software can help a community of locality to form strategic alliances with other communities. Schuler (1994) notes that disadvantaged groups particularly can use the internet to enhance social capital and make new contacts. Internet services can open up “new lines of communication” (Kavanaugh and Patterson 2001) that were not otherwise available, and enable “non-local” civic engagement (Kavanaugh, Carroll et al. 2005).

2.5 Community networks

Community has been a focus of information and communication technologies since the beginning of the internet: in 1968 Licklider and Taylor envisaged “communities not of common location, but of common interest” (1968). Since then tools have been developed for social interaction; email was one of the first applications to be developed (Hafner and Lyon 1998). Social participation is an essential aspect of overcoming digital inequalities (DiMaggio and Hargittai 2001; Warschauer 2003) and participation through a community is argued as an effective method for individuals to learn (Lave and Wenger 1991; Mäkinen 2003). Therefore it is reasonable to consider using community as a framework for enabling people to cross the digital divide. Community based approaches are often referred to as community networks and while these approaches may follow Willmott’s different types of community (locality, attachment, and interest), Beamish (1995) noted three characteristics of community networks that specifically distinguished them from other forms of computer based social networks:

- **Local:** content focus on local issues, emphasising local relevance and culture,
- **Access:** ensuring that computer provision and access to the network is made available to all members of the community and not just traditional computer users and early adaptors. Community networks are actively involved in providing public facilities, and

- **Social change / community development:** a belief that the community network with its information and infrastructure can strengthen and vitalise an existing community.

The expression ‘community network’ has been used to gather together a wide variety of functionalities, tools, and content that supports any particular community of users, and is only one of several synonyms used by researchers (Gaved and Anderson 2006).

<i>Term</i>	<i>Authors</i>
Community network	(Schuler 1994; Horrigan 2001)
Network community, networked community	(Carroll and Rosson 1998; Day 2001)
Place based community network	(Blanchard 2004)
Place based virtual network	(Blanchard 2004)
Community-based ICT initiatives	(Liff 2004)
Local Net	(Schuler 1994; Commission of the European Communities 2005)

Table 2-1: Examples of terms used to describe local ICT initiatives

The earliest community networks focussed around communities of interest in commercial and academic environments, the first places to gain internet access and a desire to outreach into community environments (Levy 1984). From the early 1970s, computers were connected to telephone lines as shared bulletin board systems (BBS)

and were used to support localised communities of interest: possibly the first was the Berkeley Community Memory (Farrington and Pine 1996) followed by groups like the Cleveland Free-Net (Stallings 1998) Santa Monica PEN and the WELL (Rheingold 1992; Figallo 1993; Beamish 1995). BBS's tended to be locally based phenomena due to the pricing structure of phone calls (long distance calls were very expensive, while local calls were lower cost or even free) and often encouraged face-to-face meetings and community action. Some BBS's became focal points for international cooperation to support local activism, such as Radio B92. This collected information under adverse political conditions in the former Yugoslavia, sent over the internet to Amsterdam, and then beamed back to local radio stations and individual listeners, "to VHS cassettes . . . screened in town squares, clubs, and cafés" (Matic 2004). Users saw themselves as part of a "global village" (Shirky 2003): a global community of participation bridged by the shared virtual spaces. Tools were text based, and the communities were still relatively small, tight knit and required a high level of expertise to participate. Community networks were largely set up and run by volunteers (National Public Telecomputing Network 1994).

The emergence of the world wide web in the 1990s led to a rapid expansion in the number of internet users, and saw a great increase in the number of community networks and in 1994 Doug Schuler estimated that there were over a hundred North American 'community networks' either operational or in the planning stages (Schuler 1994). These pioneers had focussed attention on the possibilities of ICTs as a growing force within the new information society, and helped focus political attention on the effect the internet was having across society. Community networks gave many people their first opportunity to access the internet and offered a shared

experience and practical support. By the mid 1990s many were still operating via BBS's and early networking tools, but generally they were moving to newer and more user friendly world wide web based services, and many struggled to maintain their role as it became easier for the public to gain internet access through a wider variety of providers.

The 1990s also saw increased governmental interest in the possibilities and pitfalls in the increased usage of the internet, and how the new "information superhighways" (National Information Infrastructure 1992) might change society. Research interest also continued to grow in the 1990s considering the impact of ICTs within geographical communities, such as the previously noted 'Ties that bind' conference (Cisler 1994) and RAND Corporation study (Anderson, Bikson et al. 1995). The RAND study examined the possible advantages and pitfalls of universal email access and noted that citizens could be placed at a significant social disadvantage if they did not have access to the new technology.

The digital divide emphasis on access led to a number of exploratory pilot projects considering not only content, but also physical access. Limited experiments had been tried as early as the 1970s (e.g. the Berkeley Community Memory) but the 1990s saw the flourishing of community based resource centres, sometimes known as telecentres. Qvortrup identifies early centres in Denmark and Sweden in 1985 and notes that "in November 2003 there were more than 200 centres in eleven countries all over the world" (Qvortrup 1994). In the UK, the government has looked at the development of community UK Online Centres in local community centres such as libraries and town halls with the aim of "(providing) everyone in the UK with access

to computers near to where they live, as well as help and advice on using them” (Ufi Ltd. 2006). Public sector telecentres are seen as “front-line providers of e-government services” (Bertot, Jaeger et al. 2006) offering access to those with limited home resources.

The provision of local resources, however, does not equate to ubiquitous access, and even a telecentre in every town and village will not provide access to all; this will still only make the internet available to certain members of a community (Gaved and Anderson 2006). With increased opportunities to access internet resources and lower price access to the internet, focus has more recently moved to providing ubiquitous access in the same way that the NTIA telecommunications studies looked at how the USA could achieve a telephone in every home. Rather than providing “broadband islands” in communities (Day and Harris 1997) the focus is shifting to consider how to achieve access to all homes.

This research focuses on community networking initiatives that seek to connect all residents at home. To distinguish between the broader range of community networks that encompass village websites, local government and commercial telecentres, I use the expression **networked communities** to emphasise community as the central focus, and imply a shared communications infrastructure accessible to all within the community.

2.6 Networked communities

While a ‘community network’ may be a digital resource shared by a community, as simple as a village website (Liff 2004) or shared discussion board on Yahoo, a ‘networked community’ implies a network infrastructure, providing physical connectivity to its members, as well as employing ‘social software’ – “software that supports group communication” (Shirky 2003) - to increase interaction between members of the community (see discussion of social software in Section 2.7 following). Networked communities are an attempt to resolve multiple digital inequalities within a single project (Turner and Pinkett 2000; Pinkett 2001; Meredyth, Hopkins et al. 2002). Doug Schuler has suggested that “a community network is designed, used, administered, and owned by the community” (Schuler 1996) however in many cases the control over the development of a networked community initiative may be held by external agencies. Networked communities can be set up and maintained by a variety of bodies such as:

- Government organisations, for example in the Wired Up Communities project (Devins, Darlow et al. 2003)
- Universities, e.g. Blacksburg Electronic Village (Cohill and Kavanaugh 1997)
- Commercial companies, e.g. Netville (Hampton 2003)
- Local communities, e.g. Redbricks (Skyva 2002)

- Partnerships: a combination of agencies, e.g. Camfield Estates (Pinkett 2000a), Williams Bay (Wright 2005), Kelvin Grove Urban Village (Foth 2006)

The recipient community may be very active in the planning and operation of the networked community, or passive receivers of an exogenously initiated project.

Ownership and operation may change over time: government initiatives may be handed over to local groups, e.g. Cybermoor, one of the Wired Up Communities, or the local community may try to maintain a terminated commercial project, e.g. Netville (Hampton 2003).

Externally initiated initiatives have been more widely reported in the academic media and I will first turn to examine examples of these networked communities.

Grassroots initiatives, the focus of this research, have been less reported on, and we will explore these later.

2.6.1 Externally initiated networked community projects

Explorations of community usage of network services have been of great interest to government, commercial, and university researchers. As a result, a number of pilot networked community projects have been set up around the world to understand the challenges involved and identify possible successful models. Externally initiated networking community projects are those that have been conceived independently of the residents of a locality, and managed by external organisations. Residents' influence is usually limited to deciding whether or not to participate,

which may include paying for services, and services are often defined externally.

Funding is usually for a limited period of time.

Externally initiated networked community projects have achieved some degree of success, and provided valuable research outcomes. However, these projects have also faced a number of significant challenges that have limited their success. A preliminary study for this thesis examined six such projects, and these illustrate problems externally initiated community projects can face. The projects studied were:

- Blacksburg Electronic Village, Virginia, USA
- Ennis Information Age Town, Ireland
- Netville, Toronto, Canada
- Camfield Estates, Boston, USA
- Wired up Communities, UK
- Williams Bay, Australia

2.6.1.1 Limited timescale and funding

A key attribute of the studied externally initiated projects is that they have been launched with limited timescales and funding. Often, this funding is defined by the goals of the partnership, which may differ from those of the recipient community (see Section 2.6.1.2 below). The Camfield Estates project in Boston, for example, while undertaken for MIT research, was funded by a consortium of government and

private organisations, including W.K. Kellogg Foundation, Hewlett-Packard and Microsoft and various U.S. government departments for two years (Mass Impact 2003). At the end of the funding, residents had to find an alternative commercial internet connection, which most of them decided against due to cost (Mass Impact 2003). Netville, in Canada, the name given to the wired up housing estate studied by Keith Hampton, had its network infrastructure funded for three years. Its funding consortium originally consisted of over 70 groups, but participation rapidly declined within the project's first year "as organizations became unwilling or unable to provide funding and resources to support the project" (Hampton 2001b). The research consortium finished their technically focussed trial in 1999, "to the dismay of the residents who had grown to love the system and assumed it would be there indefinitely" (Hampton 2001b).

External funding can enable networking projects to develop, though it can leave local residents in difficulties at the end of the period. Ennis became "the largest community technology project in the world" (Loader, Hague et al. 2000) with 19 million euros funding, but at the end of the research timeframe the local education sector was left worried about how the technology environment would be maintained (McInerney and O'Donnell 2003; McInerney 2005). In some cases projects are then taken over or sustained by local communities, such as Cybermoor, one of the UK "Wired Up Communities", which has re-invented itself as a test-bed location for social research, and continued providing internet services partly through grant funding from European Commission ICT and society projects (Gaved and Anderson 2006).

2.6.1.2 Externally defined goals

A problem with externally initiated networking projects is that the goals of the originators may not align with those of the recipient communities. Bell, for example, one of the initiators of the Blacksburg Electronic Village, saw it as “a test bed of services that will be demanded by customers in the future” (Silver 2004). Virginia Tech was interested in performing research on the idea of a ‘wired community’” (Cohill 2000) and the academic partners were interested to see what lessons could be learned and how other similar communities might be set up (Schorger 1997). The residents were given more opportunity to participate in the decision making process as the project developed but this is a clear example where external goals may drive a project more than the wishes of the residents.

The primary purpose of the Netville local high-speed network, as envisaged by the funding consortium, was not social connectivity, but access to information. The telecommunications company viewed Netville as a site for technical research and terminated the trial in early 1999, removing domestic hardware and switching off connections. This came as a surprise to residents who had expected a permanent network connection as part of their residency. While the consortium promised to connect all houses to the technology network, only 64 of the 109 houses were ever connected (Hampton 2003).

Ennis was developed as an ICT programme “which would mutually benefit Eircom and Ennis” (McQuillan 2000, p. 25). It was funded by a telecommunications company looking to its own privatisation in the near future, and was keen to portray

itself as innovative and forward thinking (Warschauer 2003, p. 3). The project was seen as a “live pilot experiment” to test the technological, social and economic impact of the intervention (Eircom Press Release, December 1997 quoted in (McQuillan 2006)).

The project suffered from being perceived as an external intervention; there was media criticism of the direction of the project and it was considered to be out of touch with the residents (Warschauer 2002). Initial proposals had to evolve as the people of Ennis felt they were not being informed about project plans (McQuillan 2000, p. 29). Initial hopes died down and lack of progress and consultation caused hostility in the community (McQuillan 2006).

2.6.1.3 Critical mass of usage

With residents of networking projects often viewed as passive recipients, a common problem faced by externally initiated networking projects is achieving a critical mass of usage. Many projects have struggled to gain the take up they were expecting, and this may be due to technical or social reasons with residents who show an interest hindered from doing so. In several of the projects, late delivery of network connections or computers to participants hindered take up. In the Wired Up Communities project, residents experienced significant delays in some neighbourhoods getting connected and provided with a computer: in one location equipment had not been delivered after two years. Due to the delays, equipment specifications had to be changed as the original equipment could not be sourced, and refurbished computers were found not to be powerful enough to access the internet and had to be replaced with new machines (Meredyth 2003). In the Camfield Estates

project, there was a limited take up due to network connectivity not being assured across the whole of the neighbourhood (Mass Impact 2003).

Training is another significant issue, with little or poor training being a common complaint. In Netville, residents received “minor training” in the use of the intranet and the services provided, sponsored by the Magenta consortium (Hampton 2006), and relied more on each other for learning how to use the system best for community interaction. In the Camfield Estates, residents were trained how to use a community database “...selecting from an inventory of more than 150 items” (Pinkett 2002, p. 19), but not how to run the system themselves. In Williams Bay, the housing company provided an information pack as way of training, when residents moved in, however, few posted to the intranet, and hence the community resource was unable “to generate a self-sustaining ‘critical mass’ of interaction” (Arnold, Gibbs et al. 2003, p. 5). Netville also struggled to achieve a critical mass of usage, and only the threatened shutdown of the community services appeared to motivate residents into participation through a common purpose (Hampton 2003).

Residents themselves may resist the intervention, leading to lower than expected take up, and these may take a number of forms, identified by Arnold et al. researching in Williams Bay (Arnold, Gibbs et al. 2003). The technology as a means of communication may be seen as inappropriate, the tools may not be brought into the residents’ everyday practice (or ‘domesticated’) and the intervention itself might be seen as social engineering on the part of outsiders.

2.6.1.4 Inappropriate technology for local interaction

A social challenge externally initiated projects face is that the technology they present to the recipient communities may not be seen as appropriate to residents' everyday lives and forms of communication (Arnold, Gibbs et al. 2003). This was most starkly seen in Ennis. Warschauer (2002) reports that well-functioning local social systems were disrupted in order to test new showcase technology, and as a result had increased isolation amongst the unemployed, rather than leading to greater social inclusion. Recipients of state benefits had been encouraged to sign on via the internet rather than make their usual weekly visit to the Job Centre. However, while this increased the speed at which their claims could be processed, the individual claimants lost a valued opportunity to socialise as part of the community. Reputedly, a number of the subsidised computers were sold on the black market, and training was not supported by awareness training to help people understand the purpose of the new technology (Warschauer 2002).

In the Wired Up Communities project, combinations of hardware and networking devices were issued for comparative experimental reasons rather than because of suitability of purpose, leaving residents frustrated. This reinforced some people's beliefs that ICT was of no relevance to their lives (McQuillan 2000). In the Blacksburg Electronic Village 'early adopters' made most use of the technology to communicate, with limited use of social tools by the wider majority of the community. Kavanaugh and Patterson suggest that this may support Putnam's research (2000) indicating that technology per se may not increase communication and generate social capital across the community: "... Experience in Blacksburg

suggests that...social capital may turn out to be a pre-requisite for, rather than a consequence of, computer mediated communication” (Kavanaugh and Patterson 2002, p. 177). Hampton and Wellman (2003, p.294) note that the widest use of the video tools in Netville was to show off its functionality to visiting relatives, and in Williams Bay, while there was some use made of the intranet, but it was not recognised as an appropriate means to communicate between neighbours (Arnold, Gibbs et al. 2003).

2.6.1.5 Domestication of technology

Residents of communities might not wish to use new technologies in their daily lives, and resistance to this domestication of networked computers into everyday practices is a challenge encountered by the exogenously initiated projects. In order to be well used, technologies need to be appropriated by the community and ‘recognised’ as a useful domestic artefact. While the Williams Bay houses were designed with “advanced communications and information system ... installed as a standard household feature” (Arnold 2000) and residents chose to move in to these high-technology apartments, nevertheless the intranet was considered as ‘too American’ by some and not well used (Arnold, Gibbs et al. 2003). The Blacksburg Electronic Village services were mostly used by ‘early adopters’, and that the ‘late majority’ were found to use the services much less (Kavanaugh and Patterson 2002). In the Wired Up Communities project, a lack of appropriate content was noted to have alienated residents. The focus of this project was on testing physical connectivity, and the project partners were not as concerned with the social aspects of the projects: “the private sector partners were primarily interested in the opportunity for

technological innovation, and were unable to grapple with the social context of the community technology venture or with the needs of local residents” (Meredyth 2003). Employing ICT with the goal of improving social conditions require that projects consider more than successful implementation of technical innovations (Dutton, Gillett et al. 2004), and if not properly addresses they may fail.

2.6.1.6 Intervention as social engineering

Finally, an overarching challenge that externally initiated networking projects may face is that they are perceived as social engineering by outsiders and hence may face local resistance (Arnold, Gibbs et al. 2003). As noted earlier, in the Wired Up Communities project, the placing of a public telecentre in a highly contested location (a miners’ social club) led to its rejection by some residents as a community resource (Devins, Darlow et al. 2003). In Ennis, the massive injection of funding led to its own problems, with some schools not having the space to store all the equipment they were delivered (McInerney and O'Donnell 2003), and similar decisions taken without community participation led to a cautious response by local residents. The four runners-up in the same competition by comparison reported better results. Receiving less money, they had to consider more carefully how to use the money effectively and undertook consultation with local residents, and built on existing social networks as a result. These communities witnessed greater technology uptake and measured greater increases in social inclusion (Warschauer 2002). The residents of Williams Bay were also cautious about using the networked services provided, seeing it as something that was being promoted by the housing development agency, and they were not sure about how long it would last for, or whether it was just a

curiosity that was being tested for a short while. Arnold et al. suggest that the residents may have felt uneasy at a tool for community relations being “established from the top down” rather than a more ‘natural’, emergent set of community interactions developing from “‘normal’ neighbourly relations” (Arnold, Gibbs et al. 2003, p.14).

2.6.2 Grassroots responses to technological innovations

As well as ‘top down’, external interventions supported by government, commercial and academic bodies there has also been the emergence of ‘bottom up’ initiatives: locally owned grassroots responses to perceived or actual need (Skyva 2002; Sandvig 2004; Bina and Giaglis 2006). Communities have been developing their own locally devised community ICT infrastructures to bridge the digital divide, explore new technologies, and to enhance communication opportunities amongst and beyond their neighbourhoods. These range from highly motivated individuals exploring new technologies (Bina and Giaglis 2005), to low income urban neighbourhoods exploring ways of increasing social interaction (Gaved and Mulholland 2005b), and rural communities achieving their own internet connectivity (Corbett, Annison et al. 2005). I describe this spectrum of local responses as grassroots initiated networked communities.

Localised, grassroots innovation often accompanies the introduction of new technologies, both in terms of use, and appropriation in the face of a perceived ‘divide’ in access. New technologies are emergent and open to appropriation and interpretation by innovators, amateurs and independents: “as there is initially no

profession for an innovation there can be no professionals” (Sandvig 2004, p. 581).

Hughes’ study of the early development of electrical utilities systems (Hughes 1983) posited that there is room at the inception of new technologies for amateurs and entrepreneurs to push technologies forwards before more organised financial interests take interest and dominate.

Technologies and large scale technical systems “rarely evolve according to their original design” (Bar and Galperin 2004, p.49) and are often appropriated and used in a different way from that which they were initially conceptualised (McDonald 2002, p. 4). For example early telecommunications recording devices such as wax cylinders were intended for communicating messages from one person to another, rather than as a broadcast medium. Telephones were originally devised to allow remote listening of broadcast events such as concerts and church services⁷, rather than conceived as a communication device between individuals. The British Electrophone system relayed live theatre and music hall shows to subscribers from 1895 to 1926, and the Hungarian Telefon Hirmondó carried news, entertainment and fiction readings (Marvin 1988).

⁷ <http://earlyradiohistory.us/1902chur.htm>

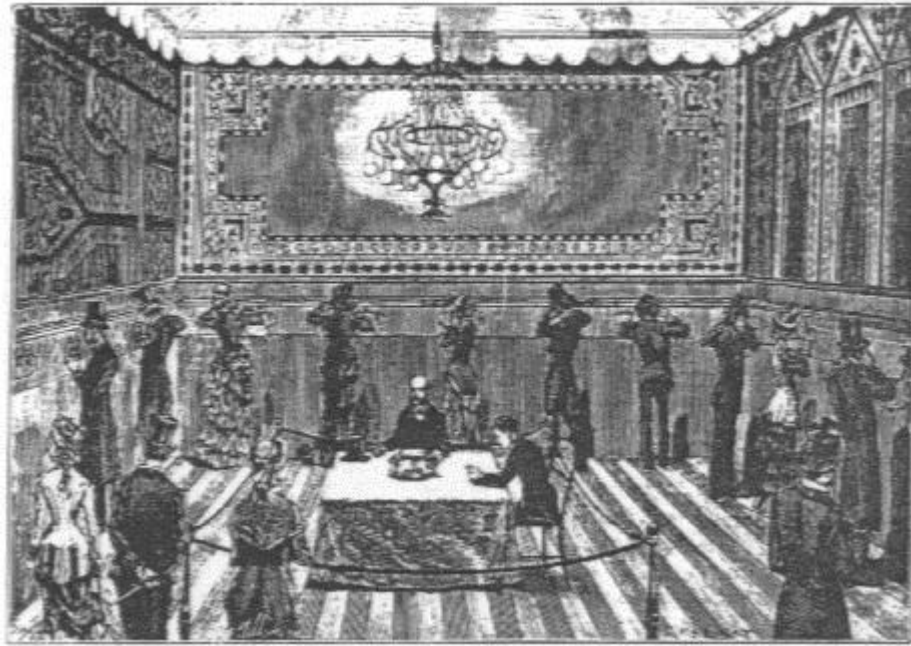


Figure 2-2: A telephone listening room at the 1881 Paris Electrical Exhibition. Listeners held a telephone receiver to each ear to hear the theatre programme in stereo.

(Illustration from "Musical Broadcasting in the 19th Century" by Elliott Sivowich, Audio, June, 1967, page 21)

New technologies are often limited in their availability and local communities may develop their own solutions to gain access to them. At the turn between the late nineteenth and early twentieth century, the telephone was the latest communication technology to sweep the world. Large companies, however, were only interested in connecting busy cities where there was a high density of subscribers (and significant financial returns) leaving more remote and rural communities unconnected. In the American mid-West, local farmers responded to this lack of access by clubbing together to pay for telephone subscriptions to locations on the edge of towns, and from here they would use the barbed wire cattle fences to run the signal out to their individual farmhouses, sharing a party line (Fischer 1992). By the 1920s, “thousands of independent telephone enterprises sprang up, most in rural areas and most as

cooperatives by farmers themselves. These farm systems were technically crude, typically enrolled less than 50 subscribers, and were run informally” (Fischer 1987, pp. 296-297).

New technologies might be available but prohibitively expensive to connect and require too high a level of technical expertise for individuals to operate. In the 1920’s in one rural US town, the president of the local telephone company decided to help overcome the barrier of access to radio (and its content) by setting up a central receiver by the telephone exchange, and from here transmitting radio programmes forward via the subscribers telephone lines (Kirk 1923).

With these historical examples in mind, it is not surprising that innovation and appropriation has also occurred with the current generation of communication technology tools and services. Peter Cochrane, formerly of British Telecom, believes that end user innovation will be the solution to achieving broadband internet access across the UK: “The self-install of wireless networks is an obvious solution and one that communities are capable of completing with minimal technical skill” (Cochrane 2003). Leadbetter and Miller echo Hughes and see a new generation of “pro-ams” – professional amateurs – stimulating innovation in society (Leadbetter and Miller 2004). Little mention of such initiatives has been made in UK strategy documents, though they have been alluded to in a recent European Commission Report (Commission of the European Communities 2005). Bina and Giaglis (2004) note that only recently has the study of community wireless networks become a recognised research area, and little peer reviewed academic literature has been published. Therefore, an in-depth academic literature review of these grassroots initiatives has

proved difficult. Documenting and describing grassroots initiated networked communities in the UK is one of the major contributions of this thesis and it is only possible to provide a brief summary of their presence in the literature to date.

2.6.2.1 A spectrum of grassroots innovators

Like the exogenous network initiatives described previously, grassroots led initiatives are not homogeneous in nature. There are a variety of reasons why people have undertaken these activities and a wide range of goals, which results in a spectrum of responses. One lens with which to view grassroots initiatives is Rogers' Diffusion of Innovation theory (Rogers 1962), which identified a 'bell curve' of adoption of innovations, from a small number of innovators, through to a larger number of the majority of users, and down to a diminishing tail of 'laggards' who will be the last to take up usage.

Grassroots initiatives can be considered as being led by innovators and early adopters finding their own means of accessing new technologies, and I will analyse this interpretation later in the thesis. Another useful resource is Hughes exploration of the idea of technological momentum (Hughes 1983). He identifies four phases in the adoption of a new technology:

1. Invention and development
2. Transfer
3. Growth in scale
4. Acquisition of momentum

Grassroots initiatives could be interpreted as exploring and framing the new territory, and finding responses to their own lack of access (Sandvig 2004). Their structure may reflect their heritage and reason for organising, whether an individual ‘pioneer’ exploring new technologies, an entrepreneur identifying a need and a market, a social enterprise working to benefit a local community, or a loose cooperative of neighbours seeking self-provision of resources. This emerging group of innovators has developed a wide range of initiatives and these have been reported and interpreted by researchers in a number of ways.

The current grassroots initiatives draw inspiration from many of the early BBS and Free-nets that were started by innovators within their local communities (Schuler 1994); indeed some of the present networked community initiatives have direct links to these groups (Stevens 2006). At their simplest, the initiatives are extending the reach of a larger network provider, or providing an alternative network. As such, the network initiatives are often defined by the conduit technology used to connect users to each other and to the wider internet. Most academic interest to date has focussed on wireless networks utilising 802.11b/g ‘Wi-Fi’ networking protocols, referring to them in a variety of terms including “self-organized networks” (Camponovo, Heitmann et al. 2003), “ad hoc networks” (Readhead and Trill 2003), “Wi-Fi networks” (Sawhney 2003; Bar and Galperin 2004), and “ad hoc community-based WLANs” (Bina and Giaglis 2004).

Wireless community networks identified within the academic literature include Seattle Wireless (Sandvig 2004), Consume in London (Sandvig 2004), NYC

Wireless (Rao and Parikh 2003), the Bay Area Wireless User Group in the USA (Bar and Galperin 2004), Île Sans Fils in Montreal (Powell and Shade 2005), and the Athens Wireless Metropolitan Network (Bina and Giaglis 2006). Grassroots initiatives based on other forms of connectivity appear less in the literature, such as the Ethernet wired Redbricks in Manchester (Skyva 2002; Davies 2004a; Gaved and Mulholland 2005a), and remote networks using satellite links (Annison 2004; Corbett, Annison et al. 2005). Often initiatives will use a combination of technologies to provide coverage to their subscribers, for example using wireless connections between groups of subscribers and then connecting homes, offices and shared properties with wired local infrastructures, or wired connection to a number of locations and then using wireless access points to provide localised wireless network clouds, creating “cordless ethernet archipelagos” (Bar and Galperin 2004).

Researchers also seek to analyse the commercial models of grassroots initiated networked communities. Bina and Giaglis differentiate “ad hoc community WLANs” from commercial networks through their operation of a “community business model” as opposed to a “commercial business model” (Bina and Giaglis 2004, p. 3) and identify that in the former cases the motivation is to provide a community service rather than profit making. Verma and Beckman (2002) similarly distinguish between “for-profit wireless internet service providers” (WISPs) and “not-for-profit neighbourhood area networks” (NANs).

Another dimension explored in the literature is the organisational model adopted by the grassroots initiated networked communities. Initiatives can vary in size from a handful of people up to several hundred, and this affects their organisation. Rao and

Parikh identify “loose federations of enthusiasts” (2003) and this is echoed by Sandvig, describing the Consume network in London as “a very loose confederation of individuals that pursue whatever projects they wish to pursue” (Sandvig 2004, p.593). Elsewhere Sandvig refers to “amateurs” but contrasts this individualistic model to a cooperative model that he also sees in grassroots initiatives (Sandvig 2003). Corbett et al. also identify grassroots initiatives organised as social enterprise structures and small private businesses (Corbett, Annison et al. 2005). The organisational model of the initiatives may in part reflect their size, the stage of their life cycle, or their goals and purposes. Sandvig notes that “while co-ops and amateurs are usually lumped together in stage models of communication system development, we expect to find that they function quite differently when involved in discovery vs. development vs. provision” (Sandvig 2003, p.3). The ‘loose federations’ may be more interested in offering free access to all than making profit (Rao and Parikh 2003) and grassroots networks often have an explicit social agenda, aiming to build social capital and encourage social networks within their host neighbourhoods (Verma and Beckman 2002). Grassroots initiatives may be formed as “a social club for technical elites” (Sandvig 2004) to allow innovators to experiment with new technologies or forms of social interaction, essentially an ‘inward looking’ group. On the other hand, there may be a strong social agenda and a desire to support community activity as “a vehicle for the frustrated needs of users that cannot find satisfaction in the offerings of existing vendors” (ibid.). Such cooperative neighborhood area networks may be well supported by the residents of the neighbourhood that they seek to serve (Verma and Beckman 2002, p. 2) and identified as part of the local infrastructure (Skyva 2002).

Most media attention and academic research has focussed on urban initiatives, however there are many examples of rural innovation (Corbett, Annison et al. 2005). These are often motivated by the same reasons that grassroots innovations were undertaken to overcome barriers to connectivity found with the early diffusion of telephone connectivity and electrical supplies: low subscriber density, distance from urban hubs, and poor existing infrastructure. Grassroots initiated networks may have as a main purpose providing “broadband access in an area not served by fixed line broadband operators” (Readhead and Trill 2003, p.77).

The provision of services not otherwise served by commercial providers, or provided poorly (e.g. at too high a price, or too lower a bandwidth) raises another important issue: sustainability. Some researchers see grassroots initiated networks as more sustainable in the long term due to their lack of reliance on outside funding (Davies 2004a); while other researchers consider their role to be limited to early innovation: “rising to prominence in the early stages of a large-scale system as a vehicle for experimentation, innovation, diffusion, popularization, and provision of features or services that are not on offer from commercial vendors” (Sandvig 2004).

The provision of features and services to the host community is an important aspect of many grassroots initiatives; as well as providing shared access to the internet, many of them seek to support community interaction and communication with a broad range of tools. These software tools, often referred to as social software, provide the means of sharing communication amongst the organisers and subscribers within the network, to help maintain and develop the initiatives and to empower communities. I will now turn to examine them in closer detail.

2.7 Social software

Social software has been described as “software that supports group communication” and can include “everything from a simple CC: line in email to vast 3D game worlds” (Shirky 2003). Social interaction has been a key driver of the internet since its inception: in 1968 Licklider and Taylor envisaged “communities not of common location, but of common interest” (1968, p.37) and talked of “on-line virtual communities”, imagining online group interactions undertaken through the new medium they were planning.

Software to support such interaction has been developed since the beginning of the internet; first in early university research settings; and then as business and industrial tools used by commercial organisations, to improve employee communication.

Virtual communities of interest have been supported by group interaction software with organisations seeking to improve work practices and profits through knowledge exchange and knowledge management. Computer Supported Cooperative Work (CSCW) and Computer Supported Learning have become key aspects of business and educational practices. Terms such as collaborative computing and groupware are also used to describe group communication tools intended to enhance organisation effectiveness (Orlikowski 1992, p.1). Peter and Trudy Johnson-Lenz are credited by many as coining the term 'groupware' in 1978, defining it as "intentional group processes plus software to support them" (Allen 2004). Often such systems are centrally managed and usage is enforced as a condition of employment (Wellman, Salaff et al. 1996, p.219).

‘Social software’ as a term was possibly used for the first time in the late 80s by K. Eric Drexler (1997) and describes the use of computer mediated communication tools within less formal environments: socially focused, loosely structured, and community shared spaces rather than ‘traditional’ workplace tools. It has been suggested that this expression has been adopted to overcome potential historical bias of previous terminologies (Allen 2004), and to encompass a broader variety of software usage. Emphasis is often placed on voluntary ‘bottom-up’ nature of social software, where sociability and interaction flourishes “based on supporting the desire of individuals to affiliate” rather than “the groupware approach ... where people are placed into groups defined organizationally or functionally” (Boyd 2005).

Examples of social software can be found from the earliest days of the internet. Email might be considered social software as it enables individuals to arrange individual and group interaction via a network. Mailing lists offered email users the opportunity to post to many subscribers on a shared list, and online archives of lists allowed asynchronous explorations of earlier discussions. From the early 1970s, computers were connected to telephone lines as shared bulletin board systems (BBS) and were used to support localised communities of interest: possibly the first was the Berkeley Community Memory (Farrington and Pine 1996) followed by such groups as the Cleveland Free-Net (Stallings 1998) Santa Monica PEN and the WELL (Figallo 1993; Rheingold 1994; Beamish 1995). BBS’s tended to be locally based phenomena due to the pricing structure of phone calls (long distance calls were very expensive, while local calls were lower cost or even free) and often encouraged face-to-face meetings and community action. BBS’s lead to the development of web

based internet forums, allowing people to post messages and to respond to others in threaded conversations via web interfaces, and are amongst the most widely used current asynchronous tools.

Synchronous communication tools have also been widely used as the internet has developed: instant messaging for real time text chat in relative privacy, and internet relay chat (IRC) for group text communication. IRC allows users to join chat rooms on topic of interest, and define whether these spaces are public or private. Current popular examples include Skype and MSN.

In 2003, Davies suggested examples of social software (Davies 2003), listed in Table 2-2.

Software	Examples
Email	Outlook, Sendmail, Pine, Hotmail
Weblogs and Wikis	Movable Type, Blogger, Wikipedia
Messenger System	ICQ, MSN, Jabber
Document Editing System	Groove, Hydra, Notes
Group Diaries	Live Journal
Introducer System	MeetUp, Udate, Ryze
Group Discussion System	SmartGroups, BBS, Usenet

Table 2-2: List of social software examples (Davies 2003)

Davies' list is interesting: it captures a moment in time when social software was moving from a specialised area of interest into mainstream media consciousness. At the time I began this research literature review (in late 2003) social software was used in the workplace in its 'traditional' guise of tools to enhance workplace efficiency (cf. Orlikowski (1992) and Wellman, Salaff, et al. (1996)); but also beginning to be explored as a tool for more informal social interactions, and being picked up by opinion leaders within the online media. A large number of people were using internet tools such as bulletin boards and email to interact socially, but only recently had internet commentators Clay Shirkey and Matt Jones attempted to define the term as a coherent concept and collect together the various social activities people were undertaking as a single activity (Jones 2003; Shirky 2003). Within the voluntary sector, Surman and Reilly were also exploring how internet tools could be used for collaboration, publishing, mobilisation and observation and were exploring "the appropriation of networked technologies within civil society" (Surman and Reilly 2003, p.1).

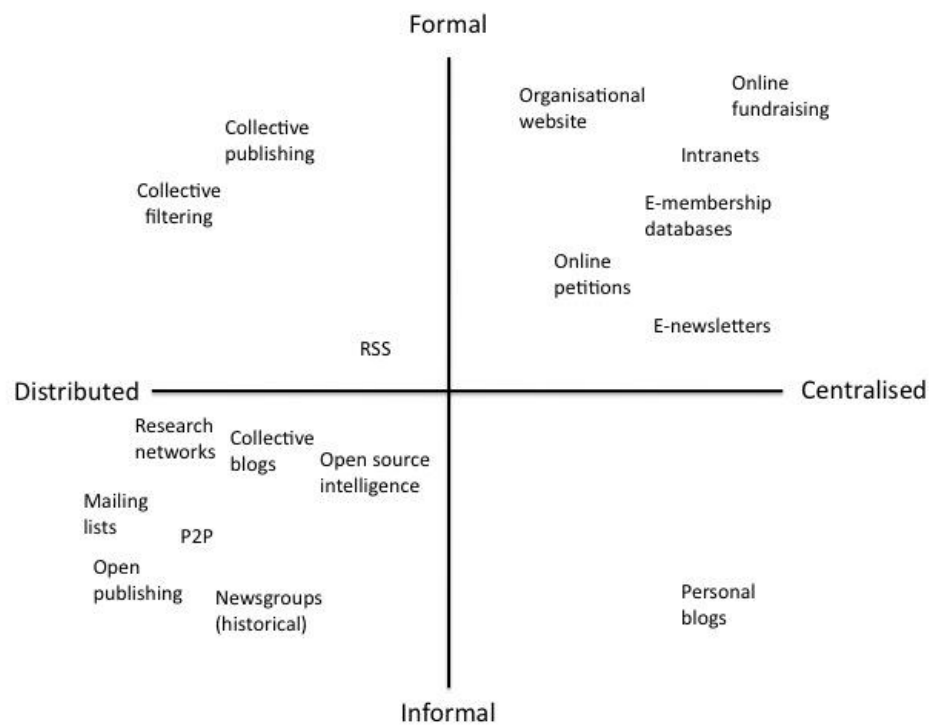


Figure 2-3: Major strategic uses of the internet (Surman and Reilly 2003)

This naming of the concept and concurrent interest in the mainstream usage of the internet of a social medium lead to a rapidly expanding growth of experiments, tools and services, and social software has become a widely discussed field from research through to mainstream media. The variety of social software and corresponding academic research has exploded in scale over the last five years, since shortly after the research proposal was formed, and already it is necessary to note that the environment has changed dramatically since the original literature review and corresponding fieldwork was undertaken. In order to contextualise the fieldwork (Chapter 4 and following) I will summarise the key tools and ideas that could be considered to be the current generation of social software as the fieldwork was undertaken.

2.7.1 A snapshot of the social software environment at the time of the fieldwork

It is difficult to define what exactly 'social software' is, as distinct from any other software: Boyd (2005) asks "what isn't social software?". He suggests that low cost, high bandwidth network access for a large number of people has provided the catalyst for millions of people to be able to experiment with tools that offer social interaction and communication. Boyd proposes that social software is built around one or more of three premises:

1. Support for conversational interaction between individuals or groups - including real time and "slow time" conversation, like instant messaging and collaborative teamwork spaces.
2. Support for social feedback - which allows a group to rate the contributions of others, perhaps implicitly, leading to the creation of digital reputation.
3. Support for social networks - to explicitly create and manage a digital expression of people's personal relationships, and to help them build new relationships.

Examples of real time conversation tools include MSN Messenger⁸ for text chatting and Skype⁹ for text, voice, and video interaction. These allow both private and group conversations. Boyd's "slow time conversations" can be held in discussion boards,

⁸ <http://messenger.msn.com/>

⁹ <http://www.skype.com>

and also lead through blogs, where an online diary kept by one person offers the opportunity for readers to offer feedback. Wikis allow for collaborative authoring and debate, with several wiki software programs allowing for a discussion backchannel on every page (for example in Mediawiki¹⁰, the software engine used by Wikipedia¹¹).

Social feedback is provided in many shared discussion spaces, such as Slashdot¹², where readers are able to rate others contributions, and online auction spaces such as eBay¹³ where buyers and sellers are both rated by each other. Digg¹⁴, a technology news website, asks users both to post stories and vote on their importance, so the content and its organisation are defined by the contributors. In common with many other social software focused sites, there are multiple tools interacting, such as an RSS feed users can subscribe to, and stories automatically posting to the users own blog if they so choose.

Social network support is present in many systems that encourage individuals to connect to others using the same service and offer feedback. These could be described as social networking websites, inviting users to create an online profile of themselves, generally with a photograph, and listing their 'vital statistics' (e.g. name, age, gender, occupation) and interests. These sites are focussed on allowing users to link to and list other users as colleagues or friends and publicly demonstrate this relationship (Golder, Wilkinson et al. 2006). Some of the social networking sites could be seen as descendents of bulletin boards and allow the sharing of resources

¹⁰ <http://www.mediawiki.org/>

¹¹ <http://wikipedia.org/>

¹² <http://slashdot.org/>

¹³ <http://ebay.co.uk/>

¹⁴ <http://digg.com/>

specific to a particular interest. Web based fora allow text conversations on any subject, and with higher bandwidth and faster connections there has been a growth in multimedia there are image sharing sites (such as Flickr¹⁵), music sharing (such as Napster¹⁶) and video sharing (such as YouTube¹⁷).

Sites may be focussed on self-publishing with feedback from subscribers. Blogs, easy to author web diaries, are possibly the most widely used, with sites such as LiveJournal¹⁸ or Blogger¹⁹ offering individuals free web space to host their blogs and easy to use web authoring tools. Blogging sites often encourage individual authors to permit RSS feeds that allow other bloggers to subscribe to their postings, with the feeds appearing in the recipients own blogs, and 'trackback' facilities which allow bloggers to see who has picked up their postings. Such tools help create a social network of authors linking to each others texts and commenting on their fellow diarists postings.

With the profusion of self-publishing sites, many seek to find a niche market: MySpace²⁰ focuses on teenagers and has also become a popular space for unsigned bands to promote themselves; Facebook²¹ was originally designed for US college students (Golder, Wilkinson et al. 2006), Orkut²² has become a massive phenomenon in Brazil and friendsreunited²³ seeks to help people contact past acquaintances.

¹⁵ <http://www.flickr.com/>

¹⁶ <http://www.napster.com/>

¹⁷ <http://www.youtube.com/>

¹⁸ <http://www.livejournal.com/>

¹⁹ <http://www.blogger.com/>

²⁰ <http://www.myspace.com/>

²¹ <http://www.facebook.com/>

²² <http://www.orkut.com/>

²³ <http://www.friendsreunited.co.uk/>

Social networking support is often provided by the active use of community developed tags, or metadata, allowing users to categorise their own and others' content, creating bottom up knowledge structures, or 'folksonomies'. Social bookmarking sites such as del.icio.us²⁴ allow people to share their tags and associated resources across a range of websites.

As well as self-publishing, shared publishing tools aim to support collaborative construction of content. Wikis allow multiple users to work on the same webpages, editing and developing in a shared space. Other tools seek to bring personal computing concepts such as the wordprocessor and spreadsheet within a shared online environment (e.g. Google Docs and Spreadsheets²⁵, wikiCalc²⁶).

Shared play is another aspect of social software, with massive multiplayer online games (MMORPGs) such as World of Warcraft²⁷ and Lineage²⁸ engaging thousands or perhaps millions of participants globally at any one time. Users interact both with the software and with each other, and often the game plays the role of a persistent social space that can extend beyond its formal boundaries into other spaces such as discussion boards and fan websites (Steinkuehler 2005). Less directed virtual spaces such as Second Life²⁹ offer open-ended environments where users can develop their own narrative structures and use this space as a basis for work and play.

²⁴ <http://del.icio.us/>

²⁵ <http://docs.google.com>

²⁶ <http://www.softwaregarden.com/wkcalpha/>

²⁷ <http://www.worldofwarcraft.com/>

²⁸ <http://www.lineage.com/>

²⁹ <http://secondlife.com/>

These tools have a “fluidity and ease of use” (Shirky 2003) that differentiates them from older tools, and are reaching a much higher percentage of the general population. Social software has moved from a specialised research area to part of everyday living for a large number of people and as Steinkuehler and Williams note, they are becoming “third places” (c.f. Oldenburg (1989)) for socialising and relaxing.

The majority of these socially orientated tools have been designed to provide autonomous virtual spaces, where resources can be shared and relationships developed solely through computer mediated communications. However, such social software is also well used within localised, proximate social networks; such as workplaces (Nardi 2005), universities (Foth 2005; Golder, Wilkinson et al. 2006), and networked neighbourhoods (Skyva 2002; Foth 2005). I will now turn to explore how some of the social software tools have been used within proximate communities.

2.7.2 Social software to support proximate communities

Many of the precursors to social software have been used to support local social networking. BBS's and mailing lists helped support community based networks (Schuler 1994) and groupware enabled collaboration within office based work environments (Orlikowski 1992), building on existing relationships between neighbours and office workers. Wellman et al. noted “(m)uch on-line contact is between people who see each other in person and live locally” (Wellman, Salaff et al. 1996, p. 222).

The arrival of cheap, fast internet access available to many people allowed the development of primarily online virtual communities, but we are now also seeing software developed for these relationships appropriated and used within localised, proximate communities. Social software tools allow ‘horizontal’ communication within communities, enabling dialogue and conversation amongst members locally, as well as the ‘vertical’ communication to outside information resources afforded by internet access (van Koert 2000). While using internet access to communicate with others sharing similar interests globally, people are also able to use a network infrastructure to better communicate with their immediate neighbours, with whom they have the strong shared common interest of their locality (Davies 2004a, p. 3). We remain “physically-instantiated and geographically centred individuals and citizens” (Baker and Ward 2002, p.221). This echoes Brown and Duguid’s visualisation of work based practices as a cluster matrix (2000, p.163), where ‘networks of practice’ between companies operate alongside communication within workplaces.

Social software is being used to enhance communication, filling in the gaps between meetings. It has been identified as a means of building social capital in new neighbourhoods (Arnold 2000; Hampton 2001a; Davies 2004b; Foth and Adkins 2005). Newly planned ‘smart neighbourhoods’ that have been designed with network cabling to the home are being built with community focused software as a core service. Social software has been identified within existing communities as a means of supporting and increasing connections between residents, and enhancing local democratic processes (Mäkinen 2003).

Existing tools have been appropriated, such as mailing lists to send help requests out to neighbours (Davies 2004a, p. 47), discussion boards to support community conversations, document archives to hold minutes from residents meetings.

Encouraging local residents to use their internet connections as a local communications device is easier if the tools are already familiar and require less training. New social software tools, with their emphasis on ease of use, are also being pressed into service, for example wikis for collaborate publishing, and photo galleries to capture images of local events. Davies sees social software as being able to help the community shared specific goals that are non-critical to the community itself, such as finding babysitters.

Some of the software tools that have expanded to become global phenomena were originally designed for local social networking: Facebook was designed to enable students in Harvard to identify people across the campus in different residential houses ((Moyle 2004) quoted in (Ellison, Steinfeld et al. 2006)) yet in 2006 had grown to more than 7.5 million users. Facebook is often used by students to maintain contact with friends nearby: 49% of messages are to the same school and local students regularly exchange “pokes”, contentless short messages as a means of assuring presence (Golder, Wilkinson et al. 2006).

As more people become connected to the internet, it is likely that social software will play more of a role both locally as well as globally. This research proposes that this is the case (Proposition 3) and it is with this in mind that we approach the fieldwork for this research, investigating examples of grassroots initiated networked communities.

2.8 Summary

The review of the literature indicates a wide range of studies of the digital divide, and an appreciation for the continued value of communities of locality despite the ability of the internet to transcend distance. The ‘digital divide’ as originally perceived (NTIA 1995) has been clearly identified as too simplistic a term to distinguish between information haves and have-nots, and a more complex set of digital inequalities (DiMaggio and Hargittai 2001) is seen to divide society. In order to bring the majority of individuals within society online, a more measured approach is required than simply providing a physical connection (Warschauer 2002). Individuals must be involved as active participants rather than as passive recipients (Fischer 2002); they need to have a reason for crossing the divide (Mäkinen 2003) and have access to relevant content (Pinkett 2000b).

Participation within a community can provide a reason for crossing the divide. Community has been widely studied in academia, with little agreement on definition (Hillery 1955; Willmott 1986). However, communities of locality remain significant for many people (Calhoun 1998) despite the affordances of ICT to reduce the significance of distance. Neighbourhoods can provide informal social support for individuals moving online (Putnam 2000; Kavanaugh 2001b) and provide a meaningful reason for people to engage with the internet (Mäkinen 2003). In turn, the internet and social software has the possibility of enhancing a community through offering additional means of communication and storing information (Klein 1999).

Various approaches have been taken to overcome the digital divide using community as a framework, and policy makers and commercial organisations have tested different approaches with selected communities (Etzoni 1999; Kavanaugh 2001b; Devins, Darlow et al. 2003). Top-down interventions, however, do not appear to bridge all inequalities and may not be ultimately sustainable. External funding may stop (Hampton 2003), projects may have different agendas from the recipient communities (Kavanaugh 2001a), or residents may find little reason to participate (McQuillan 2000; Devins, Darlow et al. 2003).

The development of grassroots initiated networked communities, such as Redbricks Online (Hellawell 2001) may offer a more effective means of enabling local neighbourhoods to cross digital divides and re-address them over the long term. There is little reference to these in the literature, however there are precedents of communities undertaking grassroots solutions to access new technologies such as the telephone (Fischer 1992) and television (Cochrane 2003). The limited recognition of these initiatives in the academic literature offers an opportunity for this research to contribute to the discourse surrounding the digital divide, investigating how local communities, driven by their own goals, may provide an alternative solution to a challenge that has not been resolved by government intervention.

The application of the network infrastructure within the grassroots initiated networked communities is of significance; how the network is used is of as great importance as its presence within a community. A broad range of potential uses and some limited exploration of how it has been employed within local communities is

identified in the literature, and this research will explore how externally driven (or grassroots) initiatives have used software tools to support community interactions.

In the next chapter, I turn to a consideration of the methodologies that can be employed to explore how grassroots initiated networked communities may be investigated.

3 Research approach and methodology

“How do you expect to find anything out if you don’t communicate with us?”

(Quote from Kitchen Stories (Salmer fra Kjøkkenet), 2003, directed by Bent Hamer)

3.1 Introduction

In this chapter I discuss the research methods I will be using. I first consider theoretical frameworks that have informed the research methods, then consider the specific research instruments used for data collection and analysis, and finally reflect on possible research issues that might arise.

3.2 Methods of enquiry

The choice of an appropriate set of research methodologies to undertake a piece of research is important as this can lead to the success or failure of the research itself. Academic research has been greatly influenced by the ‘scientific method’ of enquiry – seeking to gain knowledge through undertaking a set of objective, unbiased experiments and gathering observable quantifiable measurements, which are used to test hypotheses or predictions. This methodology is best applied in highly controlled situations such as laboratory experiments, and lends itself to application in scientific fields. Research investigating social issues, however, is often undertaken in a more complex ‘real world’ environment where the researcher has little control over

contributory factors, and hence over-rigorous application of the scientific method may be inappropriate for social research ‘in the field’ (Gomm 2004, p. 4).

Scientific methods are valued for their emphasis on achieving objectivity, and adherents sometimes accuse social researchers of not being objective and scientific. However, a positivistic approach may ignore the significance of context for a socio-technological system (Klein and Myers 1999), and alternative methodologies may prove more effective. Social researchers argue that “rigour is evident in research when the methods used are those that can represent the fullest, most detailed, rich and expressive picture of a particular situation” (Branigan 2002, p.12). Furthermore, some social scientists are critical of the claims of scientific methodologies to provide ‘objectivity’, arguing that pure objectivity can never be achieved (Malina 2001). Choosing appropriate methods to capture the range of data provided is more likely to result in greater rigour and accuracy. Stoeker argues that the objectivity was only ever intended as a method for achieving accuracy, and not as a goal in itself (Stoeker 2005, p. 6). The purposes of the research must first be considered, and suitable methodologies chosen as a result of this reflection.

Positivistic scientific enquiries emphasising quantitative research methods tend to focus on hypothesis testing and in particular the role of ‘critical experiments’ whereas social sciences have tended towards a more naturalistic approach portraying “research as a process of exploration” (Hammersley and Atkinson 1983, p.21). Naturalistic enquiry seeks to carry out research in the real world, creating as little disturbance as possible, and focussing on description as the primary goal (ibid, p.8). Methodologies such as ethnography and anthropology employ this approach, with

the researcher often taking on the role of observer within the natural environment of the subject of research. Studies using these techniques may start with exploration, and then move towards the development of theories by applying a ‘grounded theory’ approach (Glaser and Strauss 1967), where the researcher gathers data, and then seeks to develop theory based on an analysis of the data, to understand what is happening in a situation.

The initial phase of this research will draw from this methodological approach, as I am approaching the research as a practitioner who has already been working in the field for several years, exploring the territory and informally gathering data without operating from a pre-defined theoretical framework. Based on a literature review and drawing from my own experiences as a practitioner, I will undertake a more formal survey of community networking with the goal of understanding and making sense of this phenomenon. However, the research will be guided by outline aims and objectives, so is not operating purely from a grounded theory approach and brings prior notions to focus the research, but nevertheless draws on the idea of undertaking exploratory research in the real world and seeking to make sense of what is found, aiming to achieve the balance between the two: a tension identified by Carroll and Swatmann (Carroll and Swatman 2000).

Hammersley and Atkinson (1983) referencing Junker’s work (Junker 1960) note that ethnographic research can be carried out on a spectrum from “complete observer” through to “complete participant”. Junker’s model considers the role of the researcher in relation to the ‘real world’ that they are studying. The ‘complete observer’ seeks to observe activity and affect the situation as little as possible, for

example a psychologist watching children at play from behind a one-way mirror, or viewing internet discussion boards as a ‘lurker’ without posting any messages themselves. Observation is what many people see as the traditional role of an anthropologist or ethnographer, visiting and reporting on a very different culture from their own, easily marked out as an outsider and perhaps helped by a local translator or other facilitators.

The ‘complete participant’ may seek to observe the phenomenon by seeking to integrate more fully in the environment that they are researching. This may take the form of participating in community activities to better understand the practices (e.g. learning how to become a boatbuilder (Johnson 2007)) while clearly being defined as a visitor with external motivations, through to fully engaging as a member of the researched community and possibly not revealing their role as an outside researcher, covertly writing up findings without the knowledge of the community.

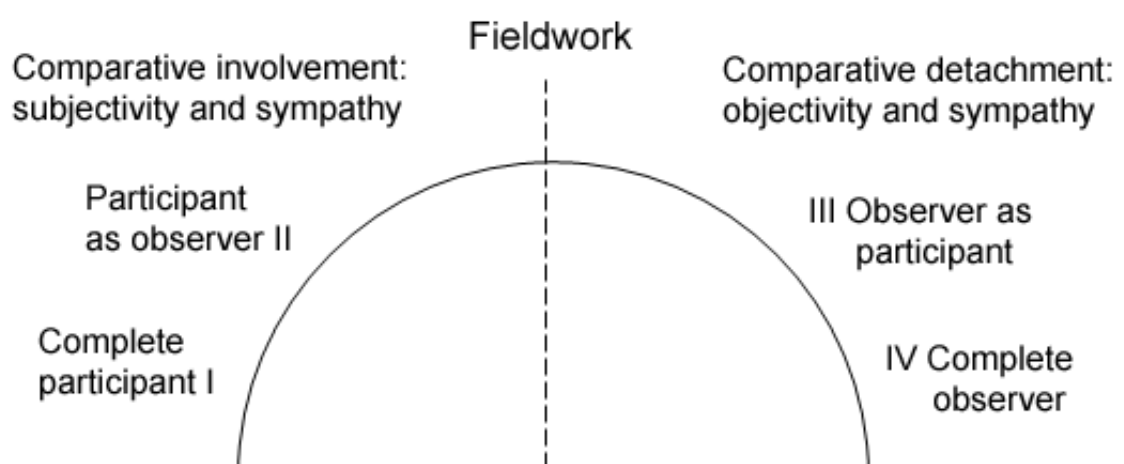


Figure 3-1: Roles for fieldwork (Junker 1960, p.36)

The researcher plays two roles; as an outsider observing, writing, and analysing, but taking the assumed identity of a member of the researched community. Researchers from an ethnographical or anthropological stance often seek to minimise what impact or alterations they have on the normal patterns of action by the researched community; their aim is to report on a community as if they were not there. The researcher's presence will however affect the community to some degree and reflection is required as to how this may be affecting the observed environment, hence the decision by some researchers to go 'under cover'. This approach to research treats the observed community as a passive data source where the goal for the researcher is to report on what is found with as little disruption as possible (ibid, p.37). Often, the researcher will find their role oscillating across this spectrum in the course of their research, rather than fixed in one place (See Figure 3-1).

An alternative approach to research within communities is to engage the community members themselves in the research. This can also be undertaken across a range of approaches, from a unilateral approach where the researcher sets an agenda and presents it to the community with limited opportunities for local input right across to research led and even instigated by the community and only facilitated or observed by the researcher. Ritas (2003) models this possible continuum, exploring the relationship between the researcher and the environment in which the research takes place.

Whereas Junker's model considers the researcher's role within the explored world, Ritas considers the role of this explored world within the researcher's work: where power resides within the research. When involved in research that seeks to effect

change, the researcher can adopt different roles, and engage within a community in a number of different ways.

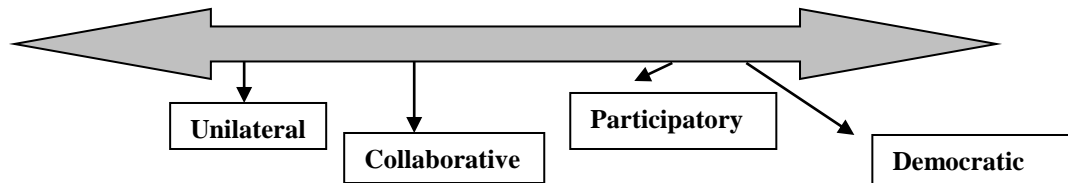


Figure 3-2: Continuum of research relationships (Ritas 2003, p.6)

At one end of Ritas' continuum, the researcher assumes a *unilateral* approach where the explored world is viewed as a passive subject, and the participants and the environment are manipulated as desired. The research agenda is set by the researcher, who controls how the work is carried out: "In this model, scientists enter a community with an established agenda and obtain agreements from service organizations or other organizations to recruit clients or members for participation in the research" (Ritas 2003, p.5). This is a typical model for observational-type social research, but could also be used to characterise government or other externally funded pilot projects where local communities are provided with computers and internet connections and observed in their use of the resources.

Further along the continuum, Ritas defines a *collaborative* research approach. Here, the researcher defines the study to be undertaken, and involves community partners in some stages, however Day, analysing Ritas' model, argues that "authority for the project still tends to be retained by the researcher" (Day 2005, p.13). *Participatory* research is driven by "a convergence of community need and researcher interest/expertise" (Ritas 2003, p.5). This form of research is more of a partnership,

with both parties contributing towards the development of the research, the definition of goals, and steering its direction. Finally, *democratic* research involves organisations agreeing to engage in a community based participatory research project, and identifying representatives to take part in all decision making processes throughout the research. This approach places the control of the research more in the hands of the participating organisations and individuals than the researcher, and the researcher is seen rather as a skilled expert who can support the community in reaching their goals.

A research project may shift along this continuum during its lifespan; and Ritars identifies that this is likely to happen in many projects (2003, p. 6). At different points in time the locus of power may move depending on what actions are being undertaken. There may be an open forum at the beginning of a project where decisions are taken in a participatory/democratic mode, and from there the researcher may be given free rein to undertake the agreed research as they feel fit, or on the other hand the researcher may have developed a proposal unilaterally in a university, but then approach community groups and be prepared to negotiate and evolve the project to ensure their initial ideas best work within a given scenario and flexibly mutate if required to adapt to the local context.

Participatory and democratic research approaches are often found in social science fields, with some social researchers arguing that the main objective of research should be to effect change, and improve the condition of those the researcher works with (Day 2005). These approaches draw from social activist researchers such as Paolo Friere (1970), aiming to empower communities, though similar approaches can

be found in industrial democracy projects, aiming to improve workplace conditions (the “Socio-Technical Approach” to the design of work), product design, and the ‘participatory design’ approach of software development (Törpel 2005).

This fieldwork aspect of this research will be in two parts; a survey of existing state of practice investigating what kind of community networks exist, and a partnership with two communities to explore the possible development of social interaction through use of ICT tools, including the choice and configuration of the tools themselves. Therefore, the approach I intend to adopt moves between different points on Ritas’s continuum during the fieldwork. In the first part, carrying out a survey of community networks, I will be defining the research agenda and seeking to find participating groups to interview. Here, I will be operating in what Ritas would define as a unilateral mode of research. I will be seeking to engage with community researchers but I will be setting the agenda: my chosen topic of PhD research and presenting it to them, hoping for their participation. What will be negotiated will be the participation of respondents in the interviews that I want to undertake, and the provision of further information by these respondents that will be used to help my research.

Later on, I will move to a more ‘participatory’ position within Ritas’s continuum. I have a research proposal (investigating the use of social software within a networked community), but I will be seeking participation from the members of the community. I intend to engage in dialogue with the community to ascertain which approaches they think most appropriate, what tools or services they would find beneficial, and to find out how they want to carry out the research. Towards the end of the research, I

will write up my findings and this will move me back to a more ‘unilateral’ position within Ritas’ continuum. The conclusion of the participatory research will then move more towards the ‘democratic’ end of the continuum, as I will work to ensure the tools and services provided during the research are supported and maintained beyond the end of the research, through ongoing engagement and ownership by the communities themselves.

I will now consider some of the research methodologies that have influenced the approach of this research and will be used to inform the work.

3.2.1 Grounded theory

The research is influenced by the ideals of grounded theory (Glaser and Strauss 1967). This approach to the generation of theory is often used by cultural anthropologists and ethnographers, and starts from the collection of data, rather than beginning with a theory. The theory is developed, or ‘grounded’ by an iterative process of gathering data, analysis, proposing theory, and testing through further data collection. Theory is supposed to emerge through the gathering and analysis of data, and its coding to identify key characteristics. The research may begin with some broad general questions, and as the research continues the researcher reflects upon the data gathered. The initial questions should be revisited to focus the enquiry on areas that appear to be of more specific interest, and the researcher should then ask more specific questions: this is referred to as “progressive focussing” (Gomm 2004, p.235).

My research has evolved from my previous involvement in the field as a practitioner, rather than having developed out of an academic interest. The practice is ongoing on a day-to-day basis without academic stimulus, so the grounded theory approach is attractive, with its emphasis of ‘making sense of’ an existing situation and seeking to develop theory from observed practice rather than formulating novel experiments.

Stillman (2006), however, argues that starting a PhD research work from the grounded theory ideal of a “null base” is a false position, as part of the process is “to articulate a hypothesis, or at the minimum, research questions that pass muster in order to be confirmed as a PhD researcher” (Stillman 2006, p.21) and hence a ‘pure’ grounded theory stance cannot be taken. Hence Stillman argues that a ‘pure’ grounded theory approach cannot be assumed, though elements of this methodological stance may inform the researcher’s position.

3.2.2 Action research

Action research developed from American post-war industrial studies by researchers such as Lewin (1948) who sought to resolve conflict and increase worker productivity by encouraging collaborative research involving both management and workers. Action research works within existing hierarchies and seeks to achieve consensus and progress within these structures (Stoecker 2002). This approach assumes a collaboration between the researcher and participating parties within a situation. It is based on consensus theories of society; the assumption that parties wish to work together to find mutually beneficial solutions to problems (Brown and Tandon 1983). The researcher works alongside the participants to resolve a problem

or meet a need encountered within the environment; often the researcher may be brought in as a ‘professional expert’. This is of interest to me as it emphasises an active participation on the part of the researcher, rather than passive observation, and emphasises collaboration with a host community. The focus is on problem solving in the community or workplace, rather than achieving research outcomes within an academic environment (Hall 1981, p.7).

A difficulty of this approach for my research is that its heritage is very much drawn from large-scale organisational research in industry and agriculture, where a management group brings in the researcher as ‘outside expert’ to ‘solve a problem’. The ‘problem’ may be one perceived by the management but not by the community as a whole, and the level of participation by the host community is not necessarily high: action research may merely require “client tolerance” (Brown and Tandon 1983, p.290) rather than any active participation in the process.

Associated with action research is participatory action research (PAR). This can cover a range of approaches, from being a synonym for action research through to a methodology placing greater emphasis on the participation of low-ranking people within the community (Whyte 1991). In the latter variants, PAR draws upon empowerment aspects of applied research advocated by activists such as Paolo Friere (1970), often known as participatory research. I find this emphasis on the active involvement of the host community with its explicit requirement of “client participation” and “control of the entire process” (Hall 1981, pp. 7-8, pp.7-8) an attractive approach for the second part of my research. Working alongside communities to develop their own resources in a collaborative, more democratic

mode, will allow me to draw on my existing expertise and bring this knowledge to the work.

3.2.3 Participatory research

Participatory research developed from adult education programmes in Latin America devised by Paulo Friere and his colleagues, emphasising individuals' responsibility to critically analyse their own situations and organise to improve their situations (Brown and Tandon 1983, p.279). Participatory research emphasises research as being an agent for change, aiming to improve the situation of the participating community. The research is developed from within the community, and seeks to address a need or a problem identified by its members. A critical aspect is that the community rather than the external researcher holds control. The researcher works in collaboration with the community, and is valued for their external research and domain expertise, while the community provide local information, insights, and energy (ibid., p.288). Participatory research is in many ways similar to action research, seeking to achieve transformations of systems (ibid, p.292), however it could be said that while action researchers work *with* a system, participatory researchers work *against* it (ibid, p.288). Participatory research is drawn from conflict theories of society, emphasising the fundamental differences of interest amongst social groups. It argues that research should work towards creating a more equitable distribution of resources, empower oppressed groups and help develop transforming social structures. This approach emphasises action: it can be seen as very much "a community organizing approach that includes a research process" (Stoecker 2002), and is often undertaken outside of academia. The focus is on

community, rather than academic outcomes, and seeks to serve the “goals and practices of community organizations” (Stoeker 2005, p.ix).

I am attracted to this approach because of its focus on community-led research and activity. The placing of the community at the centre of the research and action processes will hopefully lead to activities and research sustained beyond the duration of the PhD process due to the active participation on the community. The deeper the involvement of the community as research participants, the more likely the project will continue as there will be more commitment. Greater involvement is also more likely to lead to greater diversity of data, leading to a greater understanding (Dick 1999). In many respects this reflects DiMaggio and Hargittai’s concerns with ensuring the sustainability of information technology initiatives, focussing on the importance of the purpose of engagement (DiMaggio and Hargittai 2001). Participatory research aims for an equitable approach, and more appropriate within a field setting where the initiative is driven by the community itself.

My chief concern with this approach is its alignment to the conflict theory of society. While I find the emphasis on encouraging self-empowerment to be very attractive, the heritage of participatory research in oppositional politics (Friere 1970; Maguire 1987) does not seem to be of major significance within my proposed research. I do not think that the communities I seek to work with will perceive their ambitions (e.g. shared affordable internet access and community intranets) as primarily an act of political conflict, nor do I think they will necessarily identify themselves as ‘marginalised and oppressed’. I anticipate they will be happy to both negotiate with existing structures and also develop alternative strategies where necessary. I do not

anticipate that their approach will be revolutionary. I expect the communities will see their actions as self-empowering and undertaking independent, alternative initiatives to achieve their goals rather than undertaking action as an act of explicit political ‘resistance’. Following Maguire, I take the approach that:

“While direct community action is an intended outcome of participatory research, people may also decide not to act at a particular point in time... The important point is that those involved in the production of knowledge are involved in the decision making regarding its use and application to their everyday lives” (Maguire 1987, p. 48).

I will also draw on other methodologies that have a participatory aspect, particularly participatory design, as used in software development, in order to form a bridge between the social and technological dimension of my research. Participatory design brings a variety of participants from different domains into the design process, partnering with technical developers to help collaboratively develop a final product, drawing on the expertise of all the participants, including eventual end users. Chin, exploring participatory design for the development of software for learning environments, identifies four main stages where participatory design techniques may be applied in the process (Chin 2004, p.111 -112):

1. **Participatory analysis:** addressing the activities to be supported, creating and evaluating scenarios, assessing technologies currently used and that could be used.

2. **Participatory design:** developing an activity and technology, based on the analysis of requirements conducted, involving users and designers/developers – elaboration of scenarios, prototyping of paper and user interface models.

3. **Prototype development:** development of the system to support the activity: based on the analysis of task, and design and testing of the tool.

4. **Participatory evaluation:** use and evaluation of the task and tool in the field – by the practitioner and developer before wider rollout (i.e. with eventual end users), or with the end users themselves.

This breakdown of stages and possible models of participation at each point offers a useful model to help inform the process of working alongside community members during this research project.

Having considered some of the influential theoretical approaches I will now consider the practical aspects of the research and examine the instruments I will use to undertake data collection.

3.3 *Research stages*

The research fieldwork will be constructed of a literature review, and two practical phases. The literature review has been reported on previously (Chapter 2). I will now report on the two practical phases.

3.3.1 Phase 1: Survey of community networks

The first phase of practical fieldwork will be a survey of networked communities. I will initially conduct a literature review to identify the communities, and draw on my prior knowledge and contacts as a practitioner. Jaeger (1987) describes the purpose of survey research as to describe specific characteristics of large groups of persons, objects or institutions. Census surveys seek to collect information from all parties; however the majority of surveys seek to gather representational opinions (Gomm 2004, p.5) due to resource limitations. This research is limited in time and finances and so it is unlikely I will be able to draw up an exhaustive list of all community networks and their activities in the UK, but I hope to achieve an understanding of the majority of activities and be able to offer a prediction of the approximate size of the phenomenon. The second part of the survey phase will be to interview a representative sample of participants.

Participants to be interviewed will be identified through the literature review, and also through the “snowball method” (Atkinson and Flint 2001), asking existing contacts who I should further contact. I will seek to interview representatives from a selection of networked communities, conducting semi-structured interviews to understand their motivations and goals.

3.3.2 Phase 2: Case study research

The second phase of practical fieldwork will be an in-depth case study collaboration with two groups. Their use of intranet tools and the community network will be investigated through interviews, focus groups, semi-structured interviews, quantitative data collection, follow-up interviews and supported by ethnographical methodologies.

A case study can be seen as the exploration over time of a “bounded system” or one or more cases through “detailed in-depth data collection involving multiple source of information rich in context” (Cresswell 1997, p.61). Case studies are generally regarded as appropriate for the study of problems where investigators have little control over events, and where the focus is on a contemporary phenomenon in some real-life context (Yin 2003, p.1). Case studies are ‘all encompassing methods’, employing other research instruments, and Yin offers a model to show the processes involved in an idealised case study method.

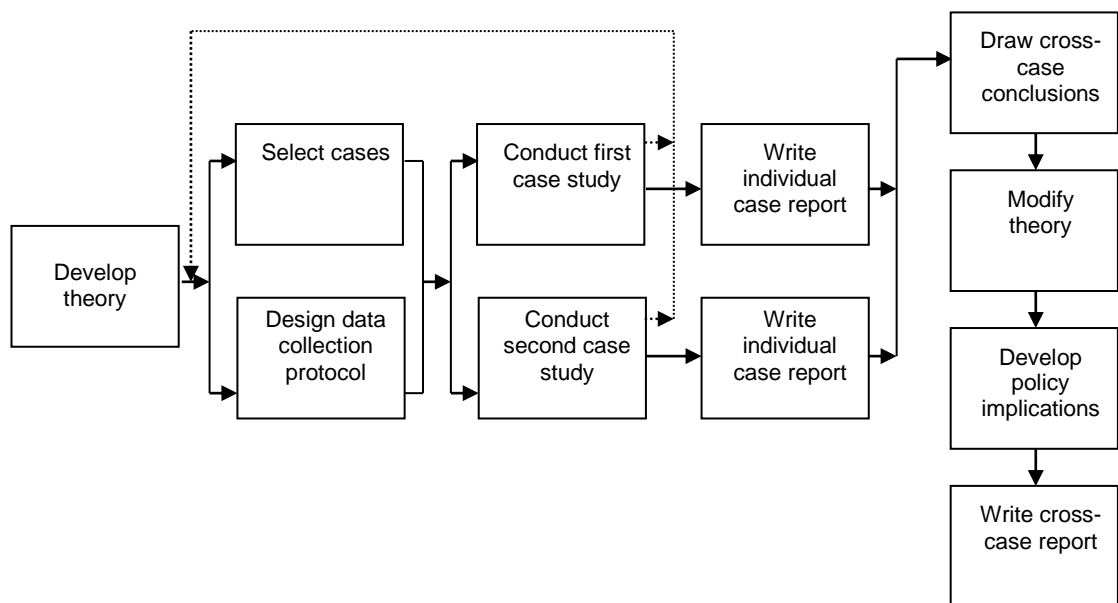


Figure 3-3: Case study method (Yin 2003, p.50) (Source: COSMOS Corporation)

During the research I will undertake comparative case studies of two groups. Evidence from multiple rather than single cases is considered more compelling, and therefore more robust, strengthening “the ability to generalize while preserving in-depth description” (Herriott and Firestone 1983, p.15). Furthermore, it reduces the dependency on a single group, as unforeseen circumstances mean that the case study cannot be carried through to completion: avoiding “putting all the eggs in one basket” (Yin 2003, p. 53, p.53). Conducting more than one case study offers the opportunity to see if findings discovered in a single case study are duplicated in other settings, and reinforce possible interpretations. I already have an ongoing relationship with one of the groups I will be working with, so a second case study will enable me to examine my effect upon the research. Can the work be duplicated in the second group where I have less influence, or does my prior involvement play a significant factor in the success or failure of the software we develop and utilise together?

The survey and case study, therefore, provide the bounding framework that will encompass the study, and I will now discuss the specific research instruments that will be used.

3.4 *Research instruments*

I will use a number of different research instruments and I will now describe each of these: literature review, semi-structured interviews, focus groups, data logging, and ethnographical/participant observing. These methods are strengthened by their

combined usages and I conclude this section with a discussion on the triangulation of methodologies.

3.4.1 Literature review

The literature review will identify the amount and breadth of community networking activity in the UK (Aim 2), as well as grounding the research in the broader philosophical and political landscape. The literature surveyed will include peer reviewed academic papers, grey literature including government and pressure group reports, and informal literature such as websites and mailing lists. I anticipate that informal literature will provide significant evidence as much grassroots community networking activity exists without external funding, therefore there is little or no requirement for groups to report on their activities through formal channels. In some cases, indeed, they may actively seek to maintain a low public profile. This is likely to complicate the search for groups and I do not expect to be able to achieve a definitive answer on the amount of activity. I expect to supplement the literature review by leveraging personal contacts who may in turn recommend further resources, such as mailing lists and further contacts.

3.4.2 Semi-structured interviews

I will seek a more in-depth understanding of the activities of communities through interviewing selected groups. Two types of interview will be undertaken: firstly, interviews with the lead members or initiators of each group approached; and secondly, interviews with ‘end-users’ within groups, defined as participating

members who do not play an active role in the management or running of the groups. The two types of interviews will provide different perspectives on each group, and will help identify how much common agreement exists regarding the purpose of the community network. Comparing the interviews for differences may help strengthen an understanding of what actually happens in the community (Hammersley and Atkinson 1983, p.200).

Interviews will take place in locations chosen by the interviewees; I anticipate this will be in the home environment, or nearby location, such as a café, pub, or community centre. I am hoping that meeting in such a “permissive, non-threatening environment” (Krueger 1994, p.6) will encourage more relaxed discussion leading to richer data. Interviews will be carried out in person, rather than via telephone or email, which will provide additional non-verbal information that might add depth or meaning to the verbal responses offered. Furthermore, a face-to-face interview may be more conducive to supporting opportunities for informal digressions, that may in themselves be valuable. The ‘sense of occasion’ created by the arrangement of a face-to-face interview may ensure a higher level of response, than by sending interview questions by email. The face-to-face interview as a relatively informal chat may also be easier to sustain than a long telephone conversation. However, interviews can be problematic, with issues of power, bias, and the desire of the interviewee to provide the answers the interviewer is looking for, so it is important to be aware of these potential pitfalls for this method to provide useful data (Myers and Newman 2007).

Interviewees will not be paid for their participation. There is evidence to show that paying respondents in surveys helps increase response rates and alters the power balance (Thompson 1996). However, a payment may act as a barrier rather than an aid to developing ongoing relationships by formalising the arrangement into a financial contract. This research seeks to draw additional insight from ethnographical observations, and it will be important to build a rapport with the interviewees, which might not be helped by formal financial agreements. A nominal payment may also be considered inappropriate or possibly insulting. I will take the approach of offering a more informal recompense such as providing refreshments or offering to hold the interview over a café lunch paid by the interviewer and anticipate that this might prove a more effective and acceptable ‘payment’.

3.4.2.1 Selection of interviewees

From the groups identified in the survey, I will seek to interview a representative number of lead members or initiators of networked communities. It is likely that the total number of networks will be small; I am anticipating less than a hundred groups across the UK. If a large number of groups are identified, I will choose participants who represent a range of projects, from urban to rural, and with different characteristics. This approach draws on the grounded theory concept of ‘theoretical sampling’ where interviewees are chosen as the research progresses that can contribute to the evolving theory and focus of the research (Cresswell 1997, p.118).

As part of each interview, I will ask the interviewee if they are aware of further participants I should contact: the “snowball method” of making further contacts

(Atkinson and Flint 2001). This will enable triangulation against my existing avenues for identifying further people to contact, offering contacts for hard to reach groups, and providing an insight into how groups are linked with each other. This may also reveal social networks within specific communities when applied in end user interviews of the broader membership. Such “chain referral” may legitimise my request to the further interviewee as a trustworthy researcher (ibid.) and may overcome reticence by a third party to participate in what might be seen as a useless and irrelevant distraction from their real work (Stoeker 2005, p.3).

3.4.2.2 Structure of interviews

The interviewee will be given a copy of the questions, in advance if possible, to allow them to consider their responses. Interviews will be recorded using a digital audio recorder, and then later transcribed for analysis. The transcriptions will be passed back to the interviewee to allow them to correct any errors, or make additional comments. Interviews with lead members will be in-depth, and be based around open-ended questions. They may be held as individual or group interviews as more than one initiator might be present, and the interview in this case might resemble a focus group. This format may provide interesting data if there are conflicting opinions. Questions are intended to gain an overall impression of the initiative, and allow interviewees free rein to discuss as they please.

End user interviews will be shorter and use mostly closed questions, with a few open-ended questions at the end of the session to gain a general overall understanding of the community network from the end user’s perspective and to

allow them to air their views more generally. These interviews will be carried out individually, to give each person the opportunity to speak in confidence. This may not always be possible, as I will be seeking to give the interviewee as much control over the environment, and they may choose to have friends or family members present. I am keen however to seek a situation where the individual feels they have the ability to voice their opinions. Group interviews may create situations where a group dynamic takes over, and not all voices are heard: Maguire notes that she preferred individual interviews in her participatory research work: “If women were fearful, embarrassed, or shy about talking in groups, starting with individual dialogue might be less threatening” (Maguire 1993, p.166). Whilst these concerns may also be true for lead members, I would expect the lead members to be more confident about talking about their enterprises than the broader membership who are likely to be less engaged and potentially less knowledgeable about the technologies they are using.

3.4.3 Focus groups

Focus groups are small structured groups with selected participants, normally led by a moderator. They are set up in order to explore specific topics, and individuals’ view and experiences, through group interaction (Litosseliti 2003). I will use them as a means to gather general impressions and ideas from members of the communities, and to understand what tools and services people wish to develop in their community intranets. A goal of focus groups is to “conduct a group discussion that resembles a lively conversation among friends or neighbors” (Morgan 1997, p.22). It is not automatic that a group of strangers will have “a ‘lively conversation’ about anything”

(ibid., p.78), however in both communities I will be working with there are already community interaction and social relationships, and I expect conversations to be easier. The negative aspect of the presence of existing social relationships is that underlying power structures or conflict may be carried over into the focus groups.

The emphasis is on encouraging interaction (Kitzinger 1994); the researcher is acting as a moderator, initiating the dialogue by defining the area of interest but with the interaction stimulating further debate amongst the participants themselves uncovering “new, open-ended pathways for discussion” (Litosseliti 2003). Focus groups have been described as being more naturalistic than interviews, with participants interviewing and interacting with each other (Krueger 1994). On a pragmatic level, within the time limitations of this research project, focus groups also have the practical advantage that they allow the researcher to gather several people together for a single session, reducing the time required as opposed to individual interviews. Furthermore, a snowball effect may occur where enthusiasts may encourage others to attend. Meeting in a “permissive, non-threatening environment” (Krueger 1994, p.6) may encourage discussion. Such a “natural environment” (ibid., p.19) will hopefully help less confident participants to contribute.

Focus groups may be recorded using audio or video devices to capture data for later analysis, however this has to be balanced against the possible intrusion that this represents (ibid.), and may reduce response from the participants. The chief purpose of the focus group is to capture data that can be then used within the project to develop the research further, so the least intrusive means of capturing data will need

to be considered. I am unlikely to use video recording, but rather audio recording and note taking, and use of flip charts and other tools to aid collaborative idea generation.

3.4.4 Data logging from community intranet servers

The second stage of the research seeks to understand the communities' usage of social software within their community networks. To interpret usage, both qualitative methods (interviews, focus groups, observation) and quantitative data collection will be undertaken. Quantitative data collection will take the form of the collection of data from the communities' intranet servers through agreement with the communities. This will be achieved by two means:

1. Text collected from the intranet boards: individual postings made by participants within the community. For example, messages posted to discussions boards, notices posted on bulletin boards, and news items. Both the content and frequency of postings will provide useful data.
2. Statistical data collected from the intranet server: visits to pages, login frequency, downloads and uploads of files. This may be gathered both from the software package and the server software.

Numerical data will be processed and analysed using a web server log file analysis program such as The Webalizer (<http://www.mrunix.net/webalizer/>) to interpret such information as number of visits, number of individual posts, number of unique posters and frequency of postings.

3.4.5 Ethnographical involvement

I will seek to gain a richer understanding through ongoing participation within the communities, drawing on ethnographical methodologies. During the fieldwork period I will seek to become more involved with the groups; participating in a wider activities and communicating informally, for example:

- Informal communications via email, instant messaging, telephone and personal contact: e.g. sharing advice on technical issues common in our practices
- Joining formal and informal groups, e.g. technical user groups, hacker workshops, conferences
- Attendance at formal and informal gatherings, such as community events, going for a drink in the local pub
- Subscribing to online newsgroups and mailing lists
- Tracking developments online, e.g. monitoring websites

As a practitioner from this culture as well as an academic researcher I am already involved to some degree within these activities, and they inform my current practice. Yin (2003, p. 94) notes that a recognised form of participant observation is to be a resident in a neighbourhood that is the subject of a case study. As both as a former resident of one of the communities, and a participant in the ‘community of practice’ of community networkers, I fulfill this role. Long term immersion is the hallmark of classical ethnography (Wolcott 1975) and it can be seen that my work will draw on

this form of methodology to add richness to the work. Like Wright, I will be seeking to utilise “unplanned encounters, chance happenings, and casual conversations” (2005, p.67) to build a greater understanding of the communities and how they interact with their community networks and each other. Often critical communication happens informally and is never explicitly documented: the exchange of tacit knowledge in informal circumstances, for example Orr’s photocopier technicians who exchanged ‘war stories’ and critical information over café breakfasts (Orr 1996). Thus, ongoing rather than sporadic contact with the communities may lead to greater trust, and hence greater access and potentially a more truthful representation by the participants.

3.4.6 Triangulation of methodologies

This research will be carried out using multiple instruments: a “multimethod study” (Morgan 1997). This approach will broaden the range of data captured, and enable a “validity check” (Hammersley and Atkinson 1983, p.198) through the cross examining of data gathered by various measures to assure its quality. Different research instruments provide different types of data: findings are “likely to be much more convincing and accurate if [...] following a corroboratory mode” (Yin 2003, p.98). This is particularly valuable in social research where the work is conducted in a real world environment away from the laboratory, and the topic of examination is very complex (Litosseliti 2003, p.17). As an exploratory study looking at a small number of cases, this will help provide ‘internal validation’ of the data, offering a means of checking against errors in collection, and reducing bias introduced by my

actions as a researcher (Stoecker 1991, p.92). Each methodology has its strengths and weaknesses and using a combination will help strengthen the research.

Source of evidence	Strengths	Weaknesses
Literature Review	<ul style="list-style-type: none"> • Stable - can be reviewed repeatedly • Unobtrusive – not created as a result of the case study • Exact – contains exact names, references, and details of an event • Broad coverage – long span of time, many events, and many settings 	<ul style="list-style-type: none"> • Retrievability – can be low • Biased selectivity, if collection is incomplete • Reporting bias –reflects (unknown) bias of author • Access- some documents may not be accessible or may be deliberately blocked
Interviews	<ul style="list-style-type: none"> • Targetted – focuses directly on case study topic • Insightful – provides perceived causal inferences 	<ul style="list-style-type: none"> • Bias due to poorly constructed questions • Response bias • Inaccuracies due to poor recall • Reflexivity – interviewee gives what interviewer wants to hear
Direct Observations	<ul style="list-style-type: none"> • Reality - covers events in real time • Contextual – covers context of event 	<ul style="list-style-type: none"> • Time-consuming • Selectivity –unless broad coverage • Reflexivity – event may proceed differently because it's being observed • Can be intrusive • Cost – hours needed by human observers

Ethnography / Participant-observation	<ul style="list-style-type: none"> • (Same as above for direct observations) • Insightful into interpersonal behaviour and motives 	<ul style="list-style-type: none"> • (Same as above for direct observations) • Bias due to investigators manipulation of events
Focus groups	<ul style="list-style-type: none"> • Time saving: allow sampling of opinions from several people at once • Group interaction may catalyse further discussion 	<ul style="list-style-type: none"> • Individuals may dominate the conversation
Data logging	<ul style="list-style-type: none"> • Stable- can be reviewed repeatedly • Unobtrusive – not created as a result of the case study • Exact – contains exact data regarding online activity • Unbiased – not affected by presence or otherwise of researcher 	<ul style="list-style-type: none"> • Indicates actions but not motivations

Table 3-1: Comparison of research methods' strengths and weaknesses

3.5 Research issues

An important aspect of this research process is to undertake a reflective approach and consider potential research issues. In this section I consider the main challenges.

3.5.1 Rigour and accuracy

A key concern of the research is to ensure that work is undertaken with the correct level of rigour, and that data collected is accurate in order to “measure or quantify results” (Branigan 2002, p.12). Social research methods are often under scrutiny for their ability to match scientific methodologies’ levels of accuracy and objectivity, however social scientists argue that “rigour is evident in research when the methods used are those that can represent the fullest, most detailed, rich and expressive picture of a particular situation” (ibid.). By choosing appropriate methods to capture the range of data provided, rigour and accuracy is more likely to be assured (Malina 2001). Using multiple research methods allows triangulation of data, assuring its quality (Branigan 2002): the re-analysis of the same data set using different methods may help substantiate claims, or reveal incorrect analyses. Involving the participating community members in the research may also help achieve accuracy; by returning copies of transcripts of interviews to participants they can check for inaccuracies in the recording of the data (Stoeker 2005, p.32).

3.5.2 Timescale challenges

This research will draw on participatory research methodologies; undertaking research alongside a host community, and negotiating the process with them as equal partners. This may prove problematic: the research timeframe is clearly defined; there is a cut off date by which all work must be completed, however, the community may operate on a different timescale. Stoeker notes that “matching the flow of

research to the flow of the project cycle is tricky” (2005, p.78) and potential problems may occur if either party’s other commitments of time and resources cause a mismatch. For example, I may not be able to make scheduled community meetings because of university commitments, or the community may decide to delay the introduction of tools into their network beyond the research cut-off period.

3.5.3 Obtaining access

One of the common concerns with social research based in the field is assuring access: “the problem of obtaining access to the necessary data looms large in ethnography” (Hammersley and Atkinson 1983, p.54). This research relies on working closely alongside communities to gather data for analysis, so gaining access will be a critical factor in the success of the work. Identifying key participants will be a significant factor. These will be the “gatekeepers” (Tushman and Katz 1980) who can provide access to the wider community, and will act as sponsors helping promote my research within the communities. As Stoeker notes, “because it is often impractical for the research to collaborate with every one in the community or organisation, the researcher needs to know who is generally held in high esteem” (2002, p.33). Gatekeepers will be able to provide access and credibility, and offer insights into how the communities function. Equally, the research may be hindered by choosing the ‘wrong’ gatekeeper.

I have the advantage of being an existing practitioner in the field, and can approach people both as a practitioner as well as an academic. It is possible that I will be more favourably received as a fellow practitioner than as an academic, however it will be

important to clearly identify my dual roles as both practitioner and researcher as “research through deception” can bring moral and practical difficulties (Hammersley and Atkinson 1983, pp.68-69). Some communities may suffer from “research fatigue” (quote from Pete from Redbricks, noted in (Skyva 2002)) and be resistant to academic investigation, so approaching these groups as a fellow practitioner trading “war stories” (Orr 1996) may be more fruitful. In other situations presenting myself as an academic researcher may be more useful, as some community groups may consider an outside academic a useful expert who can advise and improve their projects (Hammersley and Atkinson 1983, p.75).

3.5.4 Ensuring ethical research

As a researcher, it is important to consider the ethical issues involved with working alongside communities. I aim to undertake research that benefits both myself and the host communities, and not be exploitative, conscious that a great deal of anthropological and ethnographical literature warns of the potential “unequal power relations” between researchers and the communities they study (Sluka 2007, p.273). Anthropologists are expected to show “responsibility to the host community” and ensure there is informed consent from all participating (Bourgois 2007). As well as requesting permission to record face-to-face interviews and represent the data in the thesis and associated work, it will be necessary to seek permission to capture data from posts to online forums or other similar social software tools that may be retrieved. Interviewees and respondents will be given the option to opt out of participating at any stage, and have the opportunity to be presented anonymously if they prefer. As Clough notes (2009) “for consent to be truly informed, the

information given to potential participants needs to clearly communicate not only the research procedures but also confidentiality or anonymity arrangements as well as their right to withdrawal from participation”. Participants will be introduced to the procedures and arrangements at the beginning of any contact, and respondents will be contacted in a similar manner.

Hammersley and Atkinson note that this has long been a concern within anthropological research, with fieldworkers contributing to their host communities through offering their technical knowledge or domain expertise such as providing medical help, legal advice or writing letters (Hammersley and Atkinson 1983, p.81). As a practitioner myself with hard won experience of setting up and running a network I will be able to exchange expertise with the lead members of the networking groups that I interview. I will be able to share knowledge as how to implement hardware and software solutions, dealing with social challenges, and providing contacts with other groups. Community networkers, like photocopying technicians, have many war stories to share. Following a participatory research approach, I will seek to offer my expertise and time to the groups I get involved with, aiming to offer a fair trade for the time I take up when working with the groups for my research data.

3.6 Summary

In this chapter I have considered which research methodologies have influenced this research, and examined research instruments that will be used in the research itself. I have outlined the phases of the research and which tools will be used and considered

potential challenges that need to be considered. In the next chapter, I will turn to the first stage of the fieldwork aspect of the research, identifying grassroots initiated networked communities in the UK and reporting on case studies with a sample of these groups.

4 Identification of initiatives, and case study interviews

“Death to the communications monopolies! May ten thousand autonomous systems bloom!” (Consume FAQ)

4.1 Introduction

In this chapter I turn to an exploration of grassroots initiated networked communities in the UK. Government and policy making initiatives are unlikely to be able to enable everybody in the UK cross the digital divide (Cochrane 2003) and intervention led (‘top down’) networking projects have their limitations. Locally developed networking initiatives may provide an effective and sustainable alternative and are the focus of this research.

This chapter addresses the propositions raised in the introduction to the thesis (Chapter 1) and represents Phase 2 of the research (see Chapter 1, Section 1.4). I have undertaken a survey of grassroots networked communities in order to test these propositions. To achieve the research aims, I have carried out the following work:

1. **Identification of grassroots initiated networked initiatives:** a survey of grassroots initiated networked communities in the UK; through literature review, web searches, and personal communications.

2. **Interviews** of key participants in projects to gain a greater understanding of the nature of each initiative and seek to identify common features

This fieldwork was undertaken between 2003 and 2006.

4.2 Identification of grassroots initiated networked communities

To address Aim 2 of the research, estimating the prevalence of grassroots initiated networked communities in the UK, I first had to define the groups in which I was interested. Many projects and initiatives identify themselves as ‘community networks’ and ‘networked communities’ (Harrison and Stephen 1998) and it was necessary to more tightly define the characteristics of a grassroots networked community. I considered:

- Endogenous initiatives: those planned, developed and controlled from within the community rather than implemented by external bodies
- Communities that maintain a network infrastructure as well as shared computer resources and software tools

- UK based initiatives: to allow for comparison of approaches set against a similar social and political environment, and for the practical reason of allowing a visit to each initiative in person

Identification of initiatives was carried out through a literature search and personal contacts. The literature review revealed very few groups: academic reporting focused mostly on North America, and very little on the UK. Ongoing exploration of less formal ‘literature’, mainly websites and communications in online forums, proved to be more useful, with networked communities participating in these spaces rather than academic domains. Some networking groups, for example, had produced lists online of active groups, and activists inhabited a number of mailing lists and web-based forums. However, with no requirement to publish, grassroots initiated networked communities have a low profile. Initially, I defined an active group as one that had a website or had been written about in the last two years, but as the research progressed it became apparent that promotion was of little significance to the networked communities so the judgment had to be made on a case-by-case basis.

My continuing participation as a practitioner in the field enabled me to draw on existing personal contacts and in turn draw on their contacts, the so-called ‘snowball’ method of contacting groups. However this method only shows connected groups within the same social networks and means that “isolates” may be overlooked (Atkinson and Flint 2001), requiring triangulation through other methods.

Participating in practitioner events such as Hackers At Large in the Netherlands, and the World Summit for Free Information Infrastructures, London widened the number of contacts I had access to. The richest source was James from the networking group

Consume, who as a respected member of the DIY networking community enabled access for me to other groups through his introductions, in the same way that Whyte talks of gaining access to a community through being sponsored by a respected member of the subculture (Whyte 1955).



Figure 4-1: Community Broadband Network (CBN) map of community networks in UK, 2005 (data copyright Community Broadband Network, mapped with Google Maps, 2006)

Another key contact was the Community Broadband Network (CBN), a group of activists promoting community based broadband connectivity, focusing mainly on rural provision and identification of ‘notspots’ of poor or no connectivity. For rural communities this can be critical; for example farmers in the UK can only move livestock to market once forms are filled in that are only available online. The CBN undertook a survey in 2005 to establish the prevalence of community networks across the UK and Northern Ireland and this became a valuable resource in identifying additional groups not recognised through the literature review or personal contact. CBN provided me with access to their data in exchange for help in validating its content and this gave me a view of a range of groups I had not been aware of (see Figure 4-1). The survey identified over 200 groups across the UK, however closer examination revealed that many were not what I defined as grassroots initiated networked communities. Included in the dataset were externally initiated groups (e.g. some of the Wired Up Communities recipients), commercial network providers, and individual correspondents who were still at the proposal stage of developing their local initiatives.

Triangulating these data sources, it became clear that at the time of researching (2003-2006) there were only a very small number of active groups meeting my criteria, probably no more than 25 to 30. This meant that I had to rethink my method for approaching the case studies, however a positive outcome was that I identified that I had made personal contact with a majority of the operating initiatives in the UK.

4.3 Case study interviews

The second part of the fieldwork was to undertake interviews with a number of the identified grassroots initiated networked communities, to gain a greater understanding of the nature of each initiative and seek to identify common features and respond to Aim 3 and Objective 3 of the research.

The initial plan was to undertake interviews by post or email to enable me to engage with a large number of initiatives. However research indicated this method offers a low completion rate (Babbie 1992), and the number of initiatives identified was small. As I needed as near as 100% response rate as possible, I felt that making personal contact with each initiative, and offering to visit the groups in their locality would provide a higher response rate. Face-to-face interviews would provide a greater opportunity for informal discussions developing from the set questions, and visiting the location of the initiatives might offer further insight through observing the environment, following an ethnographically informed approach. Interviews were recorded using a minidisc player and high quality (though small) microphone as I considered this as the least intrusive means of capturing the interview.

My original intention was to interview a selection of members from each initiative but it became clear that this would not be feasible for every group, due to time limitations and the requirement of negotiating further access. I therefore sought to interview the lead members, or the initiators, of the groups. I defined these as the members who played the most active roles in running and maintaining the initiative and were the people identified as the point of contact for outside enquiries. These

were most likely to have the best overall view of their initiatives and frequently represented some or all of the founding team, or were in direct contact with the founders. They were well placed to discuss the history of the initiatives, and were responsible for the day-to-day running of the networks as well as taking strategic decisions.

Interviews with ‘end users’ within the initiatives would have been useful as they might provide a valuable alternative perspective, offering a comparison of such members’ perceptions of the initiative with those of the lead members. I defined ‘end users’ as those members who did not play an active role in managing, developing or maintaining the initiative. This comparison might indicate if there was a coherent vision of the initiative agreed between lead members and end users, or if tensions existed. However, to contact such end users would first require their identification and negotiated access via the lead members, and this was only managed with one group that I had more time working alongside, Digcoop. This data is therefore presented as part of the collaborative research reported upon in Chapter 6.

To give the interviews structure and allow comparison of data, a semi-structured interview was developed based on a number of open-ended questions.

4.3.1 The lead members’ semi-structured interviews

Lead member interviews were used as the chief methodological tool to understand each initiative and to provide data that could be compared to allow later theory

building. A set of questions was formulated, divided into six sections to guide each interview (for the full questionnaire, see Appendix 1).

Section 1: Community

These questions were intended to gather general information about the community that the initiative was targeting. I was interested to understand how the lead members perceived their target community and its boundaries, and some sense of their goals.

For example:

Q3. If you get everybody online in your bounded community, do you think it would be a good idea to expand the initiative?

Section 2: Networking initiative

In this section I wanted to find out more detailed information about the initiative itself. I sought to identify the goals of the initiative, its organisational structure, and hierarchy of membership. For example:

Q5. How would you describe the main benefits of the initiative to somebody else?

Section 3: Knowledge and skills

Here I sought to identify the skills lead members saw themselves contributing to the initiative, and what they saw other people contributing. I was keen to see how lead members perceived the different roles played by participants within the initiative, and what groupings existed. I was interested to gain a general overview of users' skills and abilities as seen by the lead members. For example:

Q12. Are there noticeable types of end-user in terms of their activity or involvement?

Section 4: Collaboration / information sharing

In this section I was keen to find out if the lead members of the initiative were collaborating with other grassroots initiatives, or were aware of any other similar initiatives. If so, I wanted to understand how much and what type of collaboration was occurring, for example if skills or information sharing was happening. The questions in this section were partly intended to help me find further initiatives I might not have known about. For example:

Q15. Do you see these other groups as possible collaborators or possible competition?

Section 5: Sustainability / lifespan

Here I sought to understand the potential sustainability and likely lifespan of the initiative. I was interested to explore if there were structures in place to support its longevity, and if the lead members saw the initiative as a temporary undertaking or a more permanent contribution with no conclusion. I sought to understand the funding model, and whether there were mechanisms in place to bring new people into the central group of active members. For example:

Q19. What was your goal when the initiative started? Now? What do you see your goal being in ten years time?

Section 6: Training

In this section I was keen to explore what training processes exist within the initiatives. I wanted to find out whether participants were supported formally or informally, and if it was possible for participants to learn how to run the initiative and its technologies or just to participate as end-users. A criticism of top down networked community projects is that they impose structures and training on recipient communities with little regard for the participants' needs or purposes and I was interested to find out if the grassroots initiatives offered a better model of support and training. For example:

Q21. What training process do you have for new members?

The same set of questions was asked at each interview to support a comparison of responses between the initiatives, however I did not rigidly follow the order. The conversation was allowed to drift to offer the opportunity for informal and unexpected discussions to crop up that would be not occur during a formally structured interview, and I would return to ‘missed’ questions later on in the dialogue. Furthermore, the interviews were sometimes carried out as part of a tour of the networked community by the lead members, and so were naturally broken up with conversations.

4.4 *The initiatives*

I had initially intended to select a number of initiatives to interview at the completion of a national survey of groups. However, it became clear that the survey would be ongoing through the research period, that it was only establishing a small number of possible groups, and that having made contact with initiatives that welcomed further contact it would be wise to undertake interviews in parallel with the survey process.

My original intention of gathering a long list of initiatives and then using a sampling method to draw up a short list of initiatives representing a spread of characteristics had to be abandoned in favour of interviewing all groups interested in further contact as they arose. During the fieldwork timeframe, this gave me a list of ten groups, with only one further one contacted but declining to participate in the research (West Haddon and Winwick Community Broadband). I considered this would give me a large enough sample to meaningfully analyse as comparative case studies.

Name	Location	Approx. no. of users	Established
Redbricks Online	Manchester	150	1998
Yellowbricks	Manchester	40	1998
Consume	London	100	1997
Backnet	Edinburgh	20	2001
Manchester Wireless	Manchester	20	2002
East End Net	London	80	1999
3-c.coop	Hebden Bridge	400	2003
South Witham Broadband	South Witham, Lincolnshire	30	2003
MehetNet	London	30	2004
Digcoop	London	40	2001

Table 4-1: List of interviewed initiatives

I will now present each case study. The data (interviews, additional conversations, and observations) has been summarised and broken down into subsections reflecting the structure of the interview questionnaire.

4.5 Redbricks Online

Redbricks Online, in Manchester, is one of the longest running large-scale networked communities in the UK. Started in 1998, it has subsequently informed the development of several other initiatives. Redbricks is one of few grassroots

initiatives to be identified by academic and policy researchers (Skyva 2002; Davies 2004a) and has been the subject of mainstream media interest. The data for this case study is drawn from an interview at the Redbricks office, a tour of the initiative by lead members, and a second informal meeting at a community event organized by Manchester Wireless.

4.5.1 Community

Redbricks Online is a networked community initiative connecting residents of the council owned Bentley Estate in Hulme, South Manchester. Hulme is an inner city residential area that has had a troubled architectural past; late nineteenth century slums that were cleared in the 1960s for large scale modernist housing blocks, which in turn were pulled down in 1990s regeneration. Most of the Estate has been comprehensively redeveloped but a small number of areas still have older housing, including the Bentley Estate. This comprises of 254 flats in three story maisonettes, built in the 1940s and spread across three streets.

`"a lot of people in the new Hulme don't know this part of the estate exists, and traditionally this part of the estate used to be called 'the forgotten corner'" (Cae, Redbricks, Interview 01/09/03)`

There is a wide age range of tenants, with a majority of younger single people, and there is a strong counterculture identity to the locality. Many of the residents chose to move to the Estate because of its counterculture reputation.

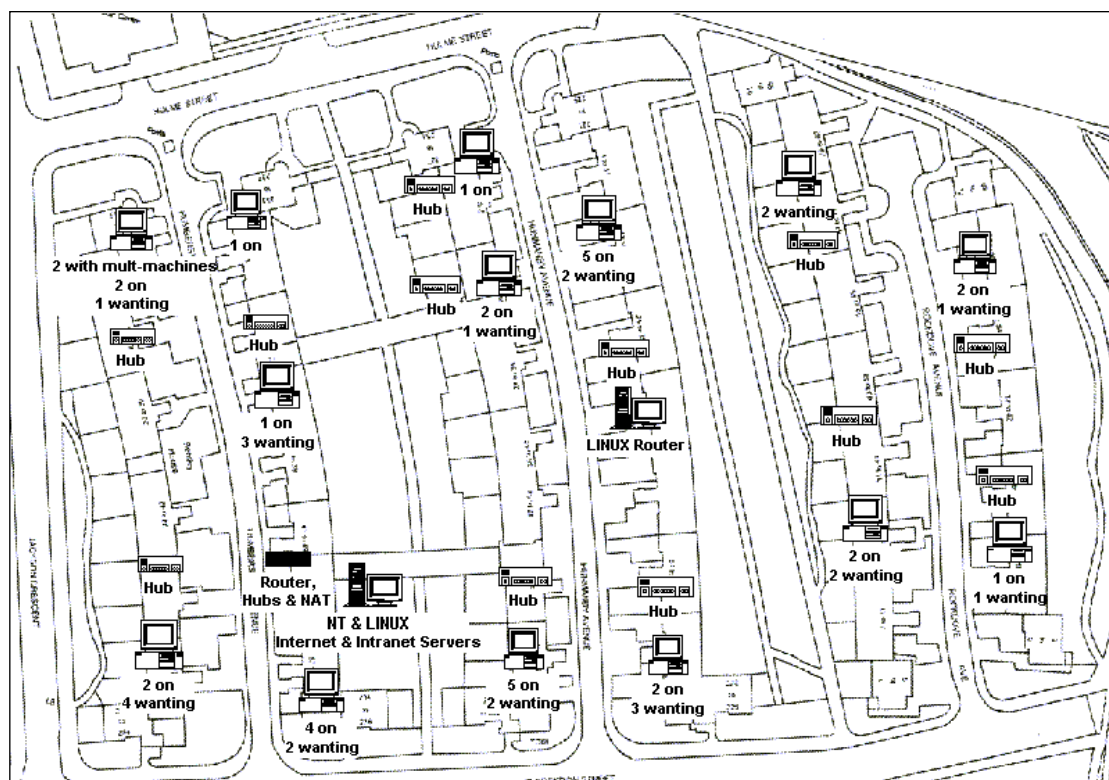


Figure 4-2: Plan view of Bentley Estate showing extent of Redbricks Online network and key network equipment (reproduced with permission from <http://www.redbricks.org.uk>, 2004)

The networked community initiative sees its goal to connect the Bentley Estate. At the time of interviewing, 150 out of the 254 flats were connected and the Redbricks Online team connects additional properties on request. The core members do not see the current project extending beyond the boundaries of the Estate; rather, they would prefer to help other people build their own networked communities in their own localities. The Redbricks team believe local identity would be lost if the project grew beyond its present boundaries, with one of the interviewees referencing Dunbar's research on the ideal size of communities (Dunbar 1993) to support his belief that

what they had was a “manageable size” and that to expand would lose its sense of identity:

“When things get beyond a certain scale, I don’t think you can legitimately claim that feeling of ownership, I think there is this feeling that it is to some extent resident owned.” (Pete, Interview 01/09/03)



Figure 4-3: View of maisonettes showing computer data cables strung across street (top right hand of photo) and from top balcony to lower flats (centre)

4.5.2 The networking initiative

Redbricks Online grew out of a previous local community initiative, Manchester Permaculture, and aims to offer cheap shared access to the internet and intranet services to residents on the estate. A shared connection into the office of the Estate's Tenants' Office is run to each property via Ethernet cables run along buildings into individual properties and across the roads between the housing blocks. Central networking equipment is in the Tenants' Office, which acts as the Redbricks Online headquarters and also has computers available for drop-in use. Individual connections are made to properties on the Estate following contact with the network team. Subscribers pay a monthly subscription of £5 and are given access to the internet, an email account, and use of the network services, which currently consists of two mailing lists that they can sign up for: "Shout" for making general announcements (e.g. "can somebody lend me a tent?") and "Act" for more political activities (e.g. "there's a demonstration this weekend"). Originally the Redbricks Online team experimented with a wider variety of services, but they found them to be difficult to maintain and not greatly used. Individual members are also running services such as music and video servers but these are not officially part of Redbricks Online, and are tolerated rather than supported.

The initiative focuses on connecting properties rather than individuals, on the premise that people will come and go and some residents may not want to be online, but the connection will be in place in a property for the next tenant. Cables are being run to houses on an ongoing basis and at the time of the interview the Redbricks

Online team were concentrating on the infrastructure of the network, connecting more properties.

Redbricks Online started as an informal group but recently formed as a limited company. Technically it is independent of the other community activities; however the interviewees (Cae and Pete) perceive it as an integral part of community development (“a community business”) and part of the wider aspirations of tenants to run the Bentley Estate themselves through a Tenant Management Organisation. The network initiative is seen as “the grease” (Cae) that aids communications. Limited company status has allowed Redbricks Online to apply for government funding and participate in a local university driven project exploring public perception of internet security. This project has brought in external funding and given Redbricks Online further public exposure. While the funding is a useful revenue stream, my impression when interviewing Cae and Pete was that further publicity was not of great interest, rather the contrary, as so much interest has been shown in the initiative that the organisers are tired of the attention.

4.5.3 Knowledge and skills

The initiative has a core team of 4 members, all of whom have been involved since the beginning. These central members perform the managerial, strategic, administrative and technical roles between them, with a loose allocation of roles. For example Pete does most of the network maintenance, and Cae describes himself as the “digital plumber”, wiring properties (though he is also one of two directors). Other members of the community provided occasional support for specific tasks, but

the core team is not actively seeking to develop this input; they believe they are able to maintain and develop the networked community project between themselves. The team is aware of a wide range of skills and abilities present among the end users of the project and seek support if they require particular help, for example in completing grant applications.



Figure 4-4: Cae Gest, lead member of Redbricks Online in Bentley Estate Tenant's Office. Local children using community resource computer in the background.

There are two levels of membership in Redbricks Online: active members who are up to date in their subscription payments and entitled to vote on decisions, and inactive members, who are not up to date on payments and not entitled to vote. Redbricks Online operates a 'no cut off' policy so members who do not pay will continue to be connected to the internet. Within the membership the central team is aware of a wide range of usage, skills and ability, from computer novices whose first introduction to the internet was the networked community project, through to computer professionals using the network to run their own software companies.

4.5.4 Collaboration and information sharing

Redbricks Online are aware of other projects in South Manchester, and also the Wired Up Communities projects in Manchester and Liverpool. Redbricks Online have been subject to media and academic interest and are both visited by researchers and asked to present at conferences, so the core team has a high level of awareness of other community networking developments across the UK. Two of the core team members now provide consultancy work on community networks (for example in Southampton) and are involved in setting up other initiatives. The team is aware of other explorations across Manchester at a council level but see these as “computer networking rather than community networks” emphasising the provision of connectivity rather than a means of social empowerment for a community. The Redbricks Online team is not proactively seeking to engage with the city council, receiving “occasional invitations to strategy meetings but ... not particularly interested”. The team cooperates to a greater level with other local grassroots networks on an informal social basis. For example, some former members of Redbricks Online have moved to a newly built housing block within walking distance and started their own networking initiative (described in greater detail in Section 4.6) and maintain close contact with the Redbricks Online team. At the time of the interview, the two groups were considering the possibility of a wireless connection between their networks, and this fitted in with Cae’s vision of forming a larger umbrella of community networks across a wider area.

Redbricks Online maintains a public face through its website, where it provides general information about the initiative, history, and detailed information about the technical infrastructure. The website also has a private members only intranet section for the community participants, and local community information, such as telephone numbers for council departments.

4.5.5 Sustainability and lifespan

Redbricks Online is funded by membership subscription, and this provides enough income to pay for the network services. Staffing is on a voluntary basis, and the majority of equipment has been acquired through donations. The project has received funding from UMIST for participation in a security project and at the time of the interview was rebuilding the network infrastructure as a result of this income.

Most of the people that started the initiative are still involved in its running, and see themselves as being involved as long as they live in the area. The team has worked on making the system as simple as possible so in future it will require little work to maintain. While Redbricks Online is currently run on a voluntary basis, the core members see it as part of the broader move by the Bentley Estate residents to take over the running of their community as a tenant management organisation. This would be a paid organisation, and if Redbricks Online was part of the broader range of services provided to tenants, it may lead to paid posts on the network initiative, which would allow expansion of their plans. The Redbricks Online teams see the future of the networked initiative tied closely to the future of the Estate:

"The network has in some way saved the estate, and the estate has saved the network. It has increased communication between people"
(Cae, Interview, 01/09/2003)

4.5.6 Training

Little training is provided within Redbricks Online. When new subscribers are connected the Redbricks Online team makes a personal visit to help connect their computers, talks the subscriber through procedures, and offer technical advice to get them started. Beyond this, there is little formal help, though the Redbricks Online team has noticed an informal development of localised training where more technically competent tenants will support others. With Redbricks Online based in the Tenants' Association office and one or more of the team there (Cae also works in the office) there is informal drop-in support provided if requested. Residents of the Estate can use the computers in the office on a drop-in basis, which can lead to informal training sessions when help is needed. The only formal training sessions that have been undertaken were through the UMIST security project, where attendees were required to attend a workshop on safe online behaviour, such as using secure websites when carrying out credit card transactions online.

4.6 Yellowbricks

Yellowbricks is a Manchester initiative with close connections to Redbricks Online. Yellowbricks operates within a self-contained housing estate and so the physical

boundaries of the networked community are very clearly defined. The initiative works in close collaboration with the housing association that owns the housing estate and is seen as an integral part of the estate's development. I became aware of Yellowbricks through the interview with the Redbricks Online lead members; they told me about the group and passed on contact details. The data collected is based on an interview with the Yellowbricks lead members, email and telephone conversations, and incidental meeting at a Manchester Wireless event.

4.6.1 Community

Yellowbricks is based in Hulme, South Manchester. The networking initiative is based within a housing estate, the Homes for Change housing redevelopment. This is a self-contained block of 72 flats and 30 business units that has won architectural awards and was built to replace some of the previous notorious estates in Hulme during the recent area regeneration. Homes for Change is run as a housing cooperative by its tenants, in association with the Guinness Housing Trust, the landlords. The development is approximately 10 minutes walk from the Bentley Estate, where Redbricks Online is based, and several former tenants have moved here. The Homes for Change estate has tenants from very young to retired, and has a strong communal and environmental culture.



Figure 4-5: View of Homes for Change housing development: the community covered by Yellowbricks

4.6.2 The networking initiative

Yellowbricks is a cooperatively run networked community initiative that started in 1998, aiming to connect all tenants and businesses within the Homes for Change Estate to a common intranet and offer shared internet access. The estate is very clearly physically defined, with properties in a large quadrangle looking onto a central garden area. Yellowbricks started as an informal group, with several members having previously lived in the Bentley Estate and having been subscribers of Redbricks Online: the similarity of the names is intentional to indicate their common heritage and goals. At the time of the interview (16/10/2003), Yellowbricks was in the process of forming itself as a legal entity. It is currently part of the larger housing cooperative, so all proposed activities have to be passed through this organization for

approval before any actions can be taken. The Yellowbricks core team is separating the networked community initiative from the parent cooperative in order to allow for financial and decision making independence.

Yellowbricks aims to provide intranet access and services to all tenants within the housing cooperative for free, and to offer a low cost internet service (£5 /month). The intranet is seen as a medium for communicating community news and developments, hence Yellowbricks will install a network connection for residents who just want this free service, but in practice residents also invariably sign up for internet access, which is provided by a shared connection into the Yellowbricks server. The Yellowbricks team is keen to help residents on low income gain access to computers, and set up and sell on low cost recycled computers ready for internet access to members. Mailing lists have been set up on the intranet, with future services planned. A key service will be an open source content management system that could be used by the management committee of the housing association: this was a central proposition within funding proposals put into both the housing association and the Department of Trade and Industry. 43 out of 72 properties on the estate are connected, and the Yellowbricks team is gradually connecting the rest, using standard Ethernet cabling run between the properties.



Figure 4-6: External view of Homes for Change housing development, including cooperative café

Yellowbricks work closely with the housing cooperative and the landlords of the estate, so all network connections meet building regulations and are in keeping with the overall planning of the estate. An original network was set up consisting of computer cables run between properties in an ad hoc manner, but this is gradually being replaced by ducted and concealed cabling as finances and time allows to create a more durable and permanent infrastructure. The laying of the cables has become an

activity which the core team use as a means of getting more residents involved, encouraging them to help connect their own properties. As time goes on, the Yellowbricks team is gradually increasing the quality of their hardware, currently replacing second hand donated hubs with high specification switches. Yellowbricks is participating in the same UMIST initiated network security project as Redbricks Online, and has also been given matched funding in exchange for members' participation in training sessions and interviews.

4.6.3 Knowledge and skills

Yellowbricks is run by a core team of four lead members working on a voluntary basis, who are responsible for all tasks carried out within the initiative. The team is keen for additional members to become involved and has run training sessions instructing subscribers to establish their own connections, teaching basic cabling skills and mounting of ducting, as the current primary task of the initiative is to provide all tenants within the estate with a connection to the intranet. The lead members hope that by encouraging subscribers to help make their own connections there will be more of a sense of community ownership of the network.

Like Redbricks, Yellowbricks has been involved in the UMIST information security project, so members have participated in workshops to learn how to take care with financial transactions when on the internet. Walking around the Yellowbricks estate, I spotted at least half a dozen strategically placed posters in public places reminding people to take care when purchasing over the internet.



Figure 4-7: “Look for the Lock”: poster in stairwell of housing development promoting UMIST supported project encouraging use of https for financial transactions via the internet. These posters could be found all around the housing development in public areas.

4.6.4 Collaboration and information sharing

As several of the Yellowbricks lead members used to be part of Redbricks Online, and the Bentley Estate is walking distance away, there are close ties between the two groups and they share information and support on a daily basis. One of the Yellowbricks lead members had previously been involved with running Redbricks and this had led in part to the setting up of Yellowbricks. Yellowbricks lead members are aware of other network initiatives in Manchester and Liverpool; however they feel there are very few networked community initiatives in existence, with more activity based around websites for local neighbourhoods rather than initiatives that also consider developing social and technical infrastructures. The lead members expressed an interest in extending contacts with other initiatives, and forming a loose ‘federation’ of networked communities to share information.

4.6.5 Sustainability and lifespan

Yellowbricks has been running since 1998, developing from an enthusiasts' home project to provide a handful of friends with cheap internet access to becoming an integral part of the housing cooperative's communications infrastructure. The group is working towards a formally incorporated legal structure (a members' cooperative). The lead members declared their interest in continuing to be part of the initiative while they lived in the housing cooperative and were interested in developing the skills of new members to help run the project. The project is sustained by monthly subscriptions from members, and has received funding support from UMIST which has enabled the purchase of improved network equipment. Yellowbricks have previously applied for funding from the Department of Trade and Industry and are currently searching out further funding opportunities, seeing this as a means to support the continued growth of the operation and reaching their future goals. An important goal of the initiative is to keep end user charges as low as possible and they see external funding as a possible means of achieving this.

4.6.6 Training

Yellowbricks offer informal training at the point of connectivity, when they configure members' machines to gain access to the internet. Beyond this there is little formal training, though the UMIST project has led to training on security when using credit cards, and information notices about this project are in evidence right across the housing cooperative. Ongoing training consists of experienced computer

users supporting the less confident, though workshops have been run on cabling to enable subscribers to establish their own connection to the network.

4.7 Consume

Consume, based in London, is one of the longest running wireless networked community initiatives in the UK, and one of few to be mentioned in academic literature. It has been highly influential as a core for wireless networking activities in the UK and has led to the set up of other similar initiatives. Consume describes its mission as providing “a collaborative strategy for the self-provision of a broadband telecommunications infrastructure” (Sandvig 2004). I became aware of Consume through my work as a community networking practitioner. The data collected in the following section was gathered through initial exploration of the Consume online public material followed by a number of face to face meetings with lead members, during which time the interview questions were asked.



Figure 4-8: Consume logo devised as self adhesive sticker

4.7.1 Community

Consume grew out from a cluster of arts and technology communities working in South London in the early 1990s. Working in and around Clink Street, there were artists, musicians, photographers and film makers, a public access space, and emerging internet businesses. A leased line had been purchased to give one of the buildings permanent internet connections. This enabled new businesses and arts to flourish, and the group hoped to connect a second building, 5 metres away across the street, but buying a second connection would be too expensive: at the time a leased line cost £40,000 a year. The original plan was to run internet cable between the buildings, but this was illegal due to planning laws. Two of the enthusiasts, Julian Priest and James Stevens decided to set up a wireless connection between the two buildings and purchased early wireless networking equipment. The connection was successful and as a result other people within the neighbourhood became interested in getting connected, sharing resources within the network as well as connectivity to the wider internet. The name Consume was chosen from one of the group's networks slogans "Consume the Net" advocating DIY solutions to the commercial and legal barriers that were preventing people from getting connected.

4.7.2 The networking initiative

Consume has spread to become probably the largest wireless network in the UK, with approximately 200 active and planned wireless access points, known as nodes³⁰ with about 100 regular users. The goal is to create a network that allows any node to

³⁰ http://dek.spc.org/julian/consume/slide_01-04.html#slide_1

talk to any other, though there are some isolated nodes out of range, as the idea has spread beyond South London and the Consume website allows anybody to set up equipment and declare themselves as a node, regardless of locality. A node map is provided on the website, and when people sign up they are able to add in their geographical details and they will then be displayed on the map, with the option of providing additional information about themselves.

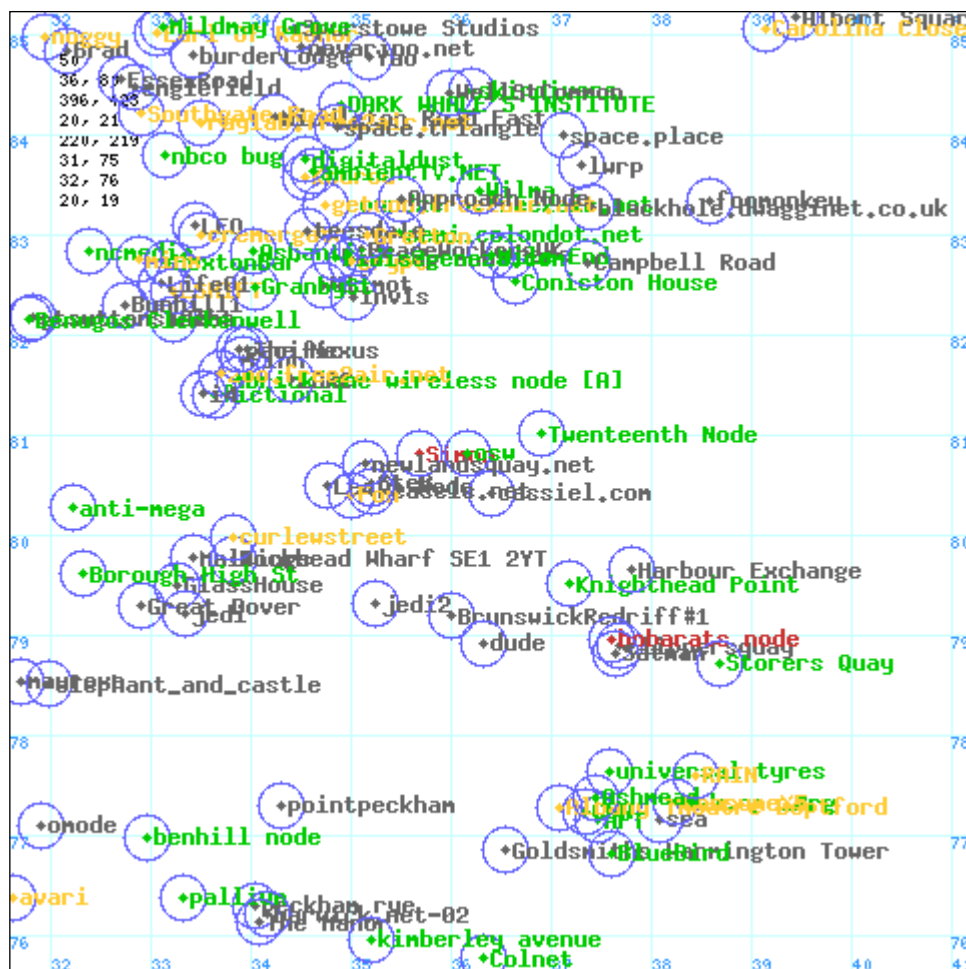


Figure 4-9: 2003 Node map of Consume participants in East London, indicating wireless access points and reach of connectivity (reproduced with permission from Consume, 2003)

Consume as an organization has no legal structure: it is a group of like-minded cooperating individuals collaborating via face-to-face meetings and online tools: a website and nine mailing lists³¹. The lead members maintain the website, and organise workshops, but do not claim any overall control over the network: the model is of a mesh of interconnected nodes that cooperate, rather than a hierarchical structure. 'Membership' is gained through joining in: "participation is entry" and each node is seen as autonomous, though Consume subscribes to the idea of 'pico-peering', which is a minimal set of agreements to share resources and allow traffic to pass freely. Individual nodes are expected to support themselves and charging for access to the internet via the node is permitted though they should not charge for using the network for internal traffic, in order to try to grow an intranet with a wide range of services and content, "shielded from the market". Consume is an advocate of the open source movement and open standards, and seeks to create a model that can be replicated elsewhere.

Consume's membership largely consists of wireless network enthusiasts, as well as a range of community activists and artists, and could be described as a community of practice bounded by locality. The community has been brought together by their shared interests and 'practice' of wireless networking, but is bounded by the technical limitations of their equipment. Wireless networking equipment requires line of sight and in an urban built up area this means only several hundred metres. The core members have ambitions to spread their network as widely as possible but are not actively seeking to 'sign up' members in the same way as Redbricks Online, looking to connect every household in a given area. Rather, Consume seeks to attract

³¹ <http://lists.consume.net/mailman/listinfo>

a community of likeminded individuals to spread their ideals of an alternative network structure to that promoted by the major telecommunications companies. The main mailing list used by the group has over a thousand subscribers internationally.

4.7.3 Knowledge and skills

The initiative is driven by a small number of core members who maintain the website and mailing lists, and promote Consume activities. The core members run their own network services, work within their own internet businesses, and have brought a high level of technical expertise. The initiative tends to attract highly technically competent technology enthusiasts. The mailing lists are the main tools for sharing information and providing support to members, who mainly act independently, though the more experienced and expert members tend to informally support novice members. Occasional workshops are held and the Consume team also sells various key pieces of equipment to members, such as wireless cards and network cables, brokering discounts from suppliers. Reflecting the members' interests and skills, there is a great deal of activity around exploring digital media content such as music and video sharing, community TV and radio.

4.7.4 Collaboration and information sharing

Reflecting the philosophical emphasis of Consume, the core members actively seek out and collaborate with other "Free Network" community initiatives, such as Seattle Wireless, and post a list of groups on their website. The core members have wide

international links and are in regular contact with other similar groups, often traveling to events such as wireless networking meets or hacker conferences, sharing knowledge and offering advice. Consume is one of the most prominent networking initiatives, and core members are called upon by journalists to offer commentary on networking issues, as well as being involved with government consultations. Core members are interested in resolving issues surrounding community networking, such as the legal framework in which they operate, standards, and exploring new technologies and this brings them into contact with a wide range of other parties.

4.7.5 Sustainability and lifespan

As an initiative without a hierarchy, and membership only defined by activity, Consume is as sustainable as long as the members choose to remain active. The core members are committed to continuing to promote their vision of free networks, and feel that it will continue as long as people are interested. With autonomous nodes responsible for their own maintenance, there is no organisational cost to keeping Consume going. External issues may affect the lifespan of the network: when it started the cost of getting a broadband connection was much higher and this was an important motivator for participation, but now prices are dropping rapidly. The core members emphasise the alternative model of networking they are developing, with a decentralised mesh of nodes, and focusing on building a content rich network rather than just cheap access to the commercial internet.

4.7.6 Training

Consume has a core membership of active participants but experiences a steady turnover of less involved members. The skills and experience are distributed in a model similar to open source software development, and many Consume members are also open source developers. Consume is keen to develop individual members' skills and runs regular technical workshops as well as core members providing informal support to new members and encouraging experienced participants to 'buddy up' with newcomers. Workshops are held in the London area on topics such as antenna building, running Linux software and setting up access points. The workshops are very practically oriented, helping individuals self-provision their own network node, and also provide opportunities to learn about media production.

4.8 *Backnet*

Backnet is an Edinburgh based initiative, one of the more recently formed groups established by wireless networking enthusiasts, the majority of whom are studying at a local university. The group is working to get a wider range of local residents involved in its activities. I became aware of Backnet through online searching. The data collected was based on an interview in Edinburgh with lead members, and ongoing email contact afterwards.

4.8.1 Community

Backnet aims to develop wireless connectivity across Edinburgh, creating a networked community from individuals and clusters who are currently working in isolation, and providing expertise to help enable more people to participate. The group was inspired by Consume's initiative, and several of the members had already participated in Consume workshops and subscribe to the mailing lists. Currently it has approximately 20 members though not all of these are active.

4.8.2 The networking initiative

The core of Backnet is a group of Edinburgh based wireless internet users, mostly working or studying at the university. The lead members are computer enthusiasts who have contacted each other through university and wireless networking links and form a loose collaborative group. Backnet, like Consume, is an informal community, with "membership [...] by participation", where "decision[s] are informed by consensus"³². The lead members of Backnet are not concerned about moving the initiative to a more formal structure: they believe the informal collective approach taken by Consume with autonomous individuals participating as they prefer is the best model for the foreseeable future. They imagine that particular aspects of their work might be performed through the creation of a non-charitable trust, such as their network registry activities, but there is no concrete plan for such an incorporation. The only formal marker of membership is the allocation of a private Backnet IP (internet protocol) address which then permits the member the opportunity to access

³² <http://wiki.backnet.org/Main/Organisation>

Backnet intranet resources by assigning this address to their networking equipment (typically a wireless access point). The list of allocated addresses is held on a publicly accessible wiki and could be considered the closest to a ‘membership list’ – showing approximately 70 addresses³³, though active members hold several addresses each.

Backnet has been operating since 2001 and has been developing a wireless infrastructure to allow its members to share access to each other through a wireless metropolitan intranet, and through the network gain access to the internet via a number of gateways. There is a core team of three members. This core group is pragmatic about their potential membership: while idealistically they would like to see mass participation across all of Edinburgh, their near term goal is to promote their activities around the early adopters of wireless in the city, and build up a nucleus of users who will run access points in sufficient density across the city to enable a wireless cloud that might draw in further participants. Currently the network consists of a few ‘islands’ of connectivity, with members supporting their immediate households and near neighbours, with some island now connecting to further ones. The highest density of connections can be found in the traditional student areas of the city.

4.8.3 Knowledge and skills

Backnet’s core team have a high level of technical expertise, and enjoy the technical challenges involved, using Backnet as a means of exploring innovative solutions to

³³ <http://wiki.backnet.org/BANANA/Addresses>

wireless connectivity. The team encourages interested individuals to come together and share skills, and run a mailing list, a website and a wiki, as well as informal meetings. The current focus of the team is to promote the concept of a wireless networked community to potential new members, and supporting new members' technical development to enable them to fully participate. These activities are seen as critical to grow the Backnet community. Key tasks are divided within the team (publicity, technical support, web site maintenance) and other participants are encouraged to help with the development of the project and increase their own expertise.

4.8.4 Collaboration and information sharing

The Backnet core team is aware of several other networked community initiatives; Backnet itself was inspired by Consume, and members regularly travel to other groups and international conferences to meet up with other networking activists to share ideas. The team are regularly in contact with Consume.net in London, and Manchester Wireless, and collaborate with the Glasgow based wireless networked community project, Glasgownet³⁴. Backnet itself has been joined by members of other network initiatives moving to Edinburgh including one from Manchester Wireless and one from Montreal's Ile Sans Fil. Backnet is very outwards looking, seeing themselves as part of a larger community of wireless networks, with each group connecting its own locality and working towards connections between the groups. Backnet maintain a public presence through their website³⁵ which provides

³⁴ <http://www.glasgownet.com/>

³⁵ <http://www.backnet.org/>

information about their activities and supporting information for other individuals who wish to connect to Backnet or start their own initiative.

4.8.5 Sustainability and lifespan

`"The Backnet network exists because the people building it think this sort of thing is great fun."`³⁶

Backnet core team members see themselves participating "for as long as we are living in Edinburgh". The motivation for the core members is very much experimentation and pleasure, with an idealistic drive to encourage more people to connect to each other and build an alternative model to the major telecommunications model of networking. There are no mechanisms in place for taking over core roles if members leave but the intention is that as a loose collective, responsibility should be distributed and that no member is irreplaceable or critical to the initiative's well-being: the initiative is what the current membership makes of it. However, the technical expertise and initiative's vision appears to be held by a small core of central members and it is not certain if the more peripheral members would be able to support the initiative if the current core team moved on. The core team sees the wiki and mailing list as a means to capture all the knowledge of the group.

³⁶ <http://wiki.backnet.org/Main/Organisation>

4.8.6 Training

As an informal network, the Backnet lead team emphasise the responsibility of current members to help train new members and share their skills and expertise across the membership. Most training is carried out informally on request from members, or when a new person contacts the group and needs help setting up their equipment. Backnet has held a number of workshops as part of a membership drive, and as a focus for engaging with other networking groups. These have included visits from members from Consume and Glasgownet, and have focused on practical technical topics such as setting up access points and building wireless antennae.

4.9 *Manchester Wireless*

Manchester Wireless is a group of wireless networking enthusiasts “dedicated to setting up a free, public wireless network in Manchester”³⁷. The group has a core of members based around Hulme in South Manchester, close to the Redbricks Online and Yellowbricks initiatives. The aim of Manchester Wireless is to create a city-wide wireless network for the Greater Manchester area using commonly available equipment, and sees free public wireless networking resources as a public utility that needs to be run by local communities to support their community activities.

³⁷ <http://www.manchesterwireless.net/>; Accessed 13 December 2006

4.9.1 Community

Manchester Wireless grew from a group of wireless networking enthusiasts in the Hulme area. Hulme is an inner-city urban area, with mixed high-density housing. Manchester is a university city with a vibrant youth and alternative culture and attracts a large number of young people. The city has a history of community ICT projects, for example Poptel ('the Popular Telematics Project'), an internet service provider that grew out of a workers cooperative (Williams 2005); the Women's Electronic Village Hall, a project focusing on supporting women using ICT, started in 1992 (Day 2001); East Serve, one of the seven Wired Up Community projects (Devins, Darlow et al. 2003), and Manchester Community Information Network, prioritising public access for "the disadvantaged/vulnerable" (Doyle 1997). However, little activity has been previously undertaken with wireless technologies, and not in South Manchester.

4.9.2 The networking initiative

The Manchester Wireless networking initiative began in 2000, and started a mailing list and formed 'officially' through a meeting in late 2002. The group aims "to create a city-wide wireless network using freely available off-the-shelf hardware, and free, open-source software"³⁸. Lead members already had links with Consume wireless network, and quote from the Consume website in their own 'mission statement:

³⁸ <http://www.manchesterwireless.net/faq.html>; Accessed 13 December 2006

"If you feel disenchanted with corporate telecoms and the stranglehold which they have over our Internet access, if you are unable to meet the costs, or even unable to receive broadband, then you will be excited, as we are, at the prospect of an open and autonomous approach to networking. We can realise some of the promise of modern communications on a local level at a fraction of the commercial cost by building our own supplements to the Internet."

Taken from the Consume FAQ

Manchester Wireless seeks to connect individuals and organisations that are unable to establish a broadband connection either through reasons of geography or cost, or looking for an alternative for political or philosophical reasons. The lead members believe that the group has an important duty to promote grassroots wireless networks as a valid alternative to commercial connectivity, and aims to promote their use in the local area. The group is also interested in using the network to encourage local content creation and sharing, and talks of developing "a rich community medium"³⁹. Manchester Wireless members have rapidly become established as the local 'wireless experts' in South Manchester and use their website to provide advice to other local residents. The group is working alongside Redbricks and Yellowbricks to help build a wireless link between the two groups, and has been approached by local community groups such as the Hamilton Road Area Community Association to help set up connections.

Originally a loose collective of wireless enthusiasts, Manchester Wireless became a charity in February 2004. This was seen as a means of legitimising the initiative, and

³⁹ <http://www.manchesterwireless.net/org/manlug/img3.html>; Accessed 13 December 2006

enables it to bid for funding: currently there is no subscription charge to members and no other revenue for the organisation. The group's constitution emphasises the building of networks, their promotion, and experimentation (Manchester Wireless 2004). The initiative has a core group of approximately ten members, with over 100 subscribers to their mailing list, including people outside of the Manchester area.

Manchester Wireless members are responsible for purchasing their own equipment and currently all members acquire their own internet connectivity. The goal is to create a local network with a limited number of connections to the internet, which would allow members to connect both to the intranet and the wider internet without necessarily purchasing their own internet connection and sharing resources via this intranet. The majority of the members have an 'open' wireless access point to allow neighbours to connect for free as the first step towards creating this network, and a small number of the members can connect to each other wirelessly. The initiative has several online communication tools, accessed via the internet: a mailing list, website, an internet chat channel and a wiki. Most of the Manchester Wireless interactions are carried out via these online tools, along with occasional face-to-face meetings.

4.9.3 Knowledge and skills

Manchester Wireless can be considered an 'expert community' – the majority of members have a high level of knowledge about their field – based around the practice of wireless networking. The public online tools are successful in attracting wider public interest, and emails are regularly sent to the list from people outside the group, asking for advice and support with wireless questions: it would seem that the

initiative is successful in playing a role offering expert support to the wider local community. In this role, members of the initiative have been approached on several occasions to support other local groups. The initiative has also resulted in the formation of another nearby wireless networking initiative, Warrington Wireless, with a number of the Manchester Wireless members being inspired to set up their own local version.

4.9.4 Collaboration and information sharing

The lead members of Manchester Wireless are a very outward looking group; they are active within a much wider circle of activists and also attract attention from outside their initiative. Manchester Wireless lead members have worked with other groups such as Consume, and subscribe to other networks' mailing lists. The constitution of the initiative explicitly notes that providing information is one of its roles:

`"Objects: (1a) Developing a knowledge-base for the technical
skills needed in the deployment of community networks"`

(Manchester Wireless 2004)

Manchester Wireless organises both group meetings and wider public meetings to encourage interaction between local groups and activists, for example a summer meeting in 2004 brought together community networkers from Redbricks, Yellowbricks, and 3-c.coop. Members of the initiative also participate in local Linux

user groups (e.g. ManLUG) and university computing groups and have given presentations about wireless networking and Manchester Wireless to these groups. The initiative's mailing list attracts most outside attention, and has drawn in new members from other wireless networking groups who have moved to Manchester, for example from Guadawireless in Spain⁴⁰, and the AWMN network in Athens⁴¹. The initiative's website maintains a list of other networking initiatives, and it is clear that the group maintain a wide range of contacts globally.

4.9.5 Sustainability and lifespan

The initiative started life as a loose collective of wireless enthusiasts with little formal structure. Each member is responsible for their own connection to the internet and their own equipment. There is no subscription cost for membership, so membership could be considered to be a matter of self-definition. The lead members see the clearest indicator of membership to be the number of people signed up to the mailing list and attending face-to-face meetings. The group has now formalised its existence as a legally constituted charitable organisation, indicating a desire by the core membership to continue their work on a long-term timescale. This formal structuring of the group also allows bidding for funding, and the initiative has successfully bid from the Community Chest Neighbourhood Renewal Fund, aimed at deprived areas, and the European Regional Development Fund. In order to move towards long term sustainability, the lead members appreciate the need to draw in as

⁴⁰ <http://guadawireless.net/>

⁴¹ <http://www.awmn.net/>

wide a range of participants as possible, and are active in maintaining the initiative's web presence, actively encouraging the "enthusiasm and support of end users".

4.9.6 Training

There is no formal training structure within the Manchester Wireless initiative, though new members usually announce their presence through the mailing list and more skilled and experienced members are quick to respond to introductory mails and offer help where it has been requested. The informal meetings of the group are also used as opportunities for technical exchanges, and occasional workshops have been set up to explore specific technical issues. The initiative's website and its wiki are intended as the main shared knowledge base for the group.

4.10 3-c.coop

3-c.coop is a networking initiative centred on the towns of Hebden Bridge and Mytholmroyd in the Upper Calder Valley area of West Yorkshire. 3-c.coop ('Calder Connect Co-operative') was formed in response to lack of broadband connectivity, and has developed into a local community service provider. It is a market town based initiative that has grown to become a broader based community networking initiative, seeking to support a range of activities. I identified 3-c.coop through attendance at a Manchester Wireless event, and was invited by the group to visit their initiative. The data was gathered through an interview with the lead members at

Hebden Bridge and a tour of the initiative, with follow-up emails and continued tracking of the public web resources.

4.10.1 Community

The 3-c.coop team identifies its recipient community as all the residents of the Upper Calder Valley area: “natural boundaries that people [can] identify with and belong to” (Robert, 3-c.coop 2004). Within the valley there are the towns of Hebden Bridge and Mytholmroyd, which were centres for the textile industry during the Industrial Revolution. The decline in the industry in the 20th century led to the area becoming economically depressed, however in 1960s and 70s there was an influx of new residents participating in the arts and counter-cultural activities. The area has been identified since then as having a strong ‘alternative’ community and there are a high number of small businesses and homeworkers. More recently the valley has become popular as a dormitory area for city workers due to its proximity to major towns and cities in West Yorkshire, Greater Manchester and Lancashire. The area has a reputation for local social activism and has been designated a Fair Trade Zone since 2003.

4.10.2 The networking initiative

3-c.coop grew from local residents’ inability to get broadband connectivity from BT in 2002. The telephone company had declined to set trigger levels for the local telephone exchanges, meaning there was no means of achieving broadband

connections via fixed telephone lines. An online forum on a local website revealed there was widespread desire to find some means of getting people connected, and so a series of meetings were held to develop a strategy for bringing in broadband connectivity and putting pressure on BT. A public meeting was held and it was agreed to set up a community internet service provider. The decision was taken to set up a co-operative company, as the area has a long association with the co-operative movement, and such a structure would allow profits to be ploughed back into the organisation to keep prices down.

A partnership was arranged with Poptel, an internet service provider with a history of supporting co-operative ventures, and wireless expertise: at this time the idea was to run a wireless network connection from the nearest broadband enabled exchanges out to the valley. Soon afterwards, BT announced that they would now enable the local exchanges to support broadband connections. Despite this, many people chose to connect through the newly formed 3-c.coop, and the initiative has now grown to support approximately 400 users.

The initiative offers broadband connections across the Upper Calder Valley. It also offers wireless connections to those members who either prefer such a connection or are too far from the telephone exchanges to get a wired broadband connection, and aims to connect as many people within the area as possible. The lead members are keen to explore network services beyond internet connectivity, and work to support community interactions:

"We don't want to expand relentlessly but keep to a manageable area which we can sustain [...] to do things to join-up our community."

(Robert, 3-c.coop 2004)

The lead members believe that if they can connect a large number of residents, then services offered such as discussion boards and voice over IP will have greater value, encouraging greater communication between neighbours and across the community. The lead members emphasise the initiative's local aspect more than its cost as the main selling point to local residents, and that it represents another aspect of the high level of social activism that is found in the area.

The initiative is formally structured as a cooperative company and operates as a local business. The initiative is run by a 14-person management committee, with sub-committees responsible for aspects such as marketing, finance, technical issues, and support. A core of approximately 20 members takes on most of the lead roles. As a cooperative, membership (nominal cost £1) entitles those who subscribe to voting rights within the organisation. Connection charges for a broadband connection vary: they are cheaper than the main commercial service providers but not significantly less, for example at the time of interviewing (17/08/2004) a standard 1Mb connection cost a £75 connection fee and then £24 / month. Wireless connectivity is less (£12 / month) and the initiative offers reductions for members sharing their connection with others, offering them the opportunity in effect to be their own micro-ISP. The 3-c.coop website even has fliers that members can download to post to their neighbours to encourage them to connect via this method. 3-c.coop has also connected ten local bars and cafes with wireless facilities and these locations offer free connectivity to

their customers. The initiative has undertaken a limited amount of promotion on a local level, such as having a table at local community events.

The initiative has a well-used Members' Forum on a public website (180 topics and 1089 posts from September 2004 - March 2006). The initiative's website has a calendar and diary system, and also a ticketing system that allows users to request support if they need help.

4.10.3 Knowledge and skills

Reflecting its origin from within the small business community, 3-c.coop is able to draw on a number of professional consultants working within the local area, several of whom are current or former members of the management committee. As well as a larger group of lead members than many of the other initiatives, 3-c.coop appears to be able to draw more effectively on its sizeable membership for additional skills and experience.

To provide technical support, a formal technical group has been set up: 'The Engine Room'. This operates as a partner to 3-c.coop and is responsible for connecting new members and offering ongoing support. This group also offers a meeting place for members to share expertise and, as an informal learning centre, it has been awarded a Social Enterprise Award of £10,000 to purchase equipment to support its further development. The Engine Room aims to be the focus for both volunteer technical support, and also provides a single point of access for paid technical expertise from within the local areas engaging local professional support. Members of the initiative

are encouraged to contact the Engine Room via their telephone number to get support, and also to use the 3-c.coop website's support forum and help system:

"What we can offer the community member unlike other commercial ISPs is physical location which is key - when there's a problem, someone local will call round for a reasonable rate and explain the different options to you, maybe put you in touch with someone else local, what it would cost for a similar BT visit isn't even comparable."

(Martin, lead members' interview, 2004)

The initiative's website is well used to exchange knowledge within the active membership with the forums in particular being used as repositories for shared knowledge. Face-to-face meetings are the main method of sharing and exchanging knowledge within the initiative, along with mailing lists.

4.10.4 Collaboration and information sharing

The lead members noted a desire to engage with other similar initiatives, and "keep their profile known". Currently the group works within the Community Broadband Network, and are in contact with a variety of groups from the "DIY projects" such as Consume through to larger funded network initiatives. The lead members offer expertise to other groups, and have acted as mentors to support emerging groups, inviting people to visit and offering technical knowledge and support. As a cooperative organisation, the initiative has been in contact with the larger community of the cooperative movement, and has shared information on their business and

operational experiences with other cooperatives sometimes working in very different fields.

As a formally constituted organisation, 3-c.coop has been able to draw in external funding, from help with incorporation (£600 from the local Hebden Royd Town Council) through to regional groups such as Yorkshire Forward, and more recent national awards (see Training, 4.10.6, below).

4.10.5 Sustainability and lifespan

Like other rural networking initiatives, 3-c.coop was initially set up as there was no other way for people to get broadband connectivity, but now finds itself in competition with BT, and other network suppliers that can offer a connection via BT's network. As a result, the initiative is seeking to compete with the larger providers not on price but by emphasising its qualities as a local community supplier.

Initially, users were supported through informal technical support but the initiative is moving towards the Engine Room providing a more formal support structure. There is an awareness both of the problem of 'volunteer burnout' but also that within the locality that there are self-employed computer support technicians, from whom 3-c.coop could be taking work away. The lead members are aiming to set up a system where such professionals could participate within the initiative, so their business benefits and 3-c.coop also has a larger pool of technicians that can help its users.

To begin with the initiative operated on a purely voluntary basis, and without a track record found it hard to bring in funding. It was only once the initiative had been up and running that they were able to find seed funding, approximately £28,000 from local community funds. Staff are now being paid “nominal” amounts but not commercial salaries, and this is something the lead members would like to address in the future.

Despite BT now providing broadband access and offering a competing service, the lead members haven’t found that they have lost many members as a result, and are still signing up new members; this happens mainly through word of mouth, with little organized promotional activity. Local people have been unhappy with the way BT has dealt with the issue of connecting the area, and signing up to 3-c.coop is a means of showing their dissatisfaction. Currently 3-c.coop charges a sign-up fee and they are aware their prices, both for this and ongoing charges may be a barrier to less well off members of the community; eventually they would like to offer subsidised rates to lower income members of the community.

4.10.6 Training

Subscribers to 3-c.coop are given initial training when they join the initiative, and ongoing informal training and support. When people join 3-c.coop and are given a connection, they are visited by a member of the technical team who helps establish their connection and shows them how to connect to the internet. 3-c.coop is keen to help members who wish to learn more and the Engine Room technical group is intended as a general meeting place where people can drop in and be given informal

training in computer skills that they are interested in learning further. 3-c.coop also runs some classes in the local education centres, and has applied for grants to offer training both to end users and also to its own support staff so they can in turn pass on skills. The initiative recently (December 2006) received an Awards4All grant of £9000 to train technicians to install and maintain wireless connections for its subscribers⁴².

The lead members of the initiative are conscious that within the community of subscribers there are people with high levels of IT expertise and they are keen to encourage knowledge sharing amongst the subscribers with informal skill sharing. Members are given a reduction in their subscription if they share a connection with a neighbour via wireless, and the lead members of the initiative are seeking to encourage local clusters of activity, so neighbours support and train each other. The team hopes that this will also encourage local community interactions, beyond the operation of the network itself.

4.11 East End Net

East End Net is a networking initiative in the east of London. The lead member, known as vortex, refers to the network as a “local instantiation” of the wider Free2Air wireless group (vortex, East End Net 2004). The initiative is one of the longest running wireless networks in the UK, starting in 1999. I was put in contact with East End Net by lead members of Consume, and developed an ongoing relationship through both my work as a practitioner and the research project. The

⁴² http://www.awardsforall.org.uk/england/york_humber/pr_beas.doc

data was gathered mostly from an interview with vortex, and through following face-to-face meetings and ongoing email and instant messaging contact. I have continued to work with vortex in my role as a practitioner and have talked informally about East End Net during this time.

4.11.1 Community

East End Net was developed by vortex and another wireless networker as a local and practical instantiation of the Free2Air group, a loose collective of wireless networking enthusiasts spread across the world. East End Net started in 1999, based in Hackney, and began connecting local artists and wireless networkers together. Free2Air is an incorporated legal company, and while East End Net has no legal structure vortex is moving towards making it a similar legal entity. Most of the work is currently carried out just by vortex, with some help from fellow wireless networkers in the area, some of whom also participate in Consume. The initiative offers an alternative network to commercial internet provision. Residents in this part of London can subscribe to one of several commercial internet connections if they prefer, but vortex sees the initiative as offering a combination of services that might be of interest to a particular kind of user: “the cracks between the pavement” rather than trying to reach “the whole streetscape”.

4.11.2 The networking initiative

East End Net uses both wired and wireless connections, providing its members with shared resources and a single connection to the internet. Vortex describes the network as wired islands connected by a wireless backbone. For example, several users are residents in two former light industrial buildings, now artists' workshops, so a wireless connection to each building is then distributed to individual users by running Ethernet cabling from a central point near to the wireless connection out to each individual user's residence.

The majority of users within the network are people working in creative industries such as artists, film makers, journalists and East End Net provides a service that they depend on for their business connection, as well as wireless networking enthusiasts. The initiative also supports a commercial internet café, and provides a link for a local charity. Vortex estimates that he has between 20 and 80 users on the network at any one time, with the wireless service being purposely left open to allow passers-by to connect if they wish. Vortex observes a range of users, and is cautious about offering definite figures, seeing "transient" users such as passers-by who log in only once or twice, "semi-transient" users such as friends of subscribers who might be connected while they are visiting, and the more permanent "intransient" users that he suggests might be close to 80. Due to the configuration of the network, the number of machines may vary and vortex might not be aware of their presence, and during the interview we had a discussion on what actual usage statistics might mean, and how well they can be interpreted. Membership is therefore of quite an informal nature, to the extent that payment for services is negotiated on an individual basis, with formal agreements set up with commercial users such as the internet café, through to occasional payments by some users, donations of equipment by others and some

users who have free access. Vortex is very keen not to accept external funding and has turned down offers, being concerned that this might affect how the initiative develops, cautious of external obligations.

Rather than seeking to gain complete coverage in a geographical area, vortex sees East End Net's role as connecting a "fairly solid space ... in terms of common interests, technology, creativity". He sees East End Net defined in scope due to "the limitation of the technology" - 802.11b/g wireless networking equipment has a maximum range and is line-of-sight, so in urban East London this forces a limit to how far the network can reach. Furthermore, vortex feels that while there are no tightly defined geographical boundaries to East End Net, the technological limitations can be seen in a positive light, forcing a "geographical cohesion" on the membership of the network initiative. Many of the users are known to each, part of an East London digital arts subculture.

The initiative has one of the most active intranets out of those studied for this research, with vortex and other users hosting servers and adding their own content. Vortex is keen to explore possible uses as he is keen that East End Net should be more than just a "community run micro-ISP" (providing connectivity to the internet). He therefore emphasises the importance of putting up experimental services to see how well they are used, and with several active content creators and digital artists as users, a variety of activities are undertaken. Users include a digital media company, Ambient.tv, which has used the network to broadcast multimedia events live across the intranet and out to the wider internet. A multimedia server has been set up that allows streaming audio and video, and a local East End Net phone service that runs

over the intranet and gives users free phone calls within the network. Vortex is keen to set up localised services that previously would have required members to connect to each other via the internet, such as instant messaging. Reflecting the nature of the membership, there is an emphasis on experimentation, including streaming audio from microphones placed at local bus stops through to a net radio station. Vortex sees the network as an experiment in exploring an alternate model to commercial internet provision, exploring both the social and technological aspects of wireless networking.

4.11.3 Knowledge and skills

The driving force behind East End Net is vortex; he describes his co-founder as a “silent partner” and so it is vortex’s day-to-day work and knowledge that maintains and develops the initiative. Within the initiative, there are several very active and technically competent members who use the system as a medium for their activities, such as internet TV, radio broadcasting, and arts projects, and there is clearly a number of active users pushing the boundaries of what can be done with the intranet. There is a high degree of interaction between these users and vortex. Within the network there is also a large number of ‘end users’ who use the initiative much as their local community-run internet service provider. These users have varying levels of knowledge; some are self-sufficient while others need support setting up their connection and occasional ongoing support. Within each “wired island” local experts provide informal support to the less experienced users. As well as sharing the skills required to use the network, there is a great deal of knowledge and equipment sharing based around digital media.

4.11.4 Collaboration and information sharing

Vortex is a highly connected wireless networking expert in contact with other initiatives and enthusiasts around the world with whom he communicates online, in exchange visits and at larger networking events. East End Net is an instantiation of broader ideals and goals, so he collaborates on not only technical developments, but also philosophical, legal and policy issues. Vortex is active in online debates and mailing lists, and contributes to the discourse both informally but also writing papers on topics such as creative commons and radio spectrum issues. East End Net is seen as an opportunity to explore some of these issues in a concrete environment, and the lessons learnt are fed back into the research he is undertaking. In a more local sense, he has close contacts with other London network initiatives and individuals, for example participating with Consume activities, the Hive Network (also in East London) and attending many of the local networking and hacker gatherings in the London area on a regular basis. Another active East End Net member is Armin Medosch, a German writer who has published a book about Free Networks (Medosch 2003), and has raised the profile of East End Net through participating in wider discussions about grassroots network initiatives.

4.11.5 Sustainability and lifespan

East End Net is driven by vortex, and its future would seem to be dependent on his continued input, though he sees the need to develop a structure for involvement,

otherwise he can see that it “might fade in the end”. He sees his involvement continuing in the long term, and sees that it has brought people together and as a result would like to see it continue into the future.

4.11.6 Training

There is little formal training for users within East End Net. Occasional workshops have been held, but most training occurs in an informal social sense, with neighbours in the wired islands sharing skills and supporting new users as they encounter problems. New members often join on the recommendation of a friend or neighbour, and the contact person will often become the local expert to help the new member. There is some skill sharing on more specific media tools being tested within the network; for example, if a group promotes a new resource such as audio streaming, they will take on the responsibility of promoting the resource and training members in how to use it. Occasional technical meetings are called via the initiative’s mailing list to solve particular technical problems, but these tend to be held at irregular intervals in response to particular problems.

4.12 South Witham Broadband

South Witham Broadband (SWBB) is one of a number of rural networking initiatives started because of poor broadband provision to rural areas by British Telecom (BT). Covering several villages, the initiative grew from local frustration at having no comparative access to the internet to that available in UK urban areas. I first met

members of SWBB through attendance at a meeting of the Community Broadband Network, within which SWBB is highly active. Data about the initiative was principally collected by a visit to South Witham. During the visit I interviewed lead members Tom and Helen and was shown around the area covered by the initiative. Following this, I arranged to visit SWBB for a working session as practitioner: SWBB act as teaching mentors for the Community Broadband Network and gave me training as a representative from Digcoop in server configuration. This enabled me to continue developing the relationship and find out more about their work. I maintained contact with lead members by email and instant messaging and further meetings of the Community Broadband Network.

4.12.1 Community

South Witham Broadband is based in South Witham, a small village in rural Lincolnshire. The network initiative aims to support internet access across five villages in the area (South Witham, Colsterworth, Woolsthorpe, Market Overton, Thistleton), all some distance from the nearest large urban areas. In common with many other rural areas of the UK, the South Witham area has had poor access to broadband services, with BT refusing to upgrade the local telephone exchange to support broadband connections until a minimum number of subscribers committed to purchasing connections. Only once this level of demand has been reached - the 'trigger level' - would they consider providing services.

4.12.2 The networking initiative

Unable to persuade British Telecom to provide high-speed connections to the area, South Witham Broadband was started in January 2004 by local residents who decided to achieve their own connectivity. Created as a not-for-profit company, SWBB took advanced orders with people signing up for membership before any connections had been made, providing the capital required to set up services. In February 2004 the company started with a satellite connection and providing broadband connectivity to the internet. The network initiative uses wireless technologies to connect its subscribers with connections up to 3.5 kilometres in distance. Subscribers include private individuals, a business estate, local pub and a community centre. In the beginning 95% of members were small businesses operating from home, though there are now more domestic subscribers.

The lead members see the current geographical reach as being close to the limit that the initiative can grow to, that any further growth will become too problematic for offering support when a difficulty occurs:

"We had one of our Directors that's just moved into Grantham and we were jumping up and down in joy thinking we'll put a mesh box in there, we can start to network part of Grantham - it's a 20 mile round journey there and back and so I had to sit him down and say, well do you really want to do this? You know, if there's a problem do you really want to be going out at night and you know spend an hour driving... You know you couldn't offer the support you could when it's a village just two minutes drive away or 10 minutes drive away. So I told him

I really didn't want him to get involved in doing that" (Helen, South Witham Broadband 2005)

The initiative has a single broadband connection into the network and then connections are spread between locations using wireless equipment. SWBB uses LocustWorld meshboxes, a set of proprietary software packages that offer meshing functionality. Rather than explicitly defined point-to-point wireless connections, this software automatically connects with its neighbours and will reconfigure connections if a line is dropped, and will find a way to re-route signals, which is very useful in a larger wireless network where connections may drop for a variety of reasons. The original satellite connection was replaced with a broadband connection via BT when this became available, as a much cheaper alternative. ADSL has less latency (delay built into the system), which is important for SWBB users as a number of services are affected by latency such as VoIP (Voice over Internet Protocol), online games, and last minute bidding on eBay.

SWBB is organised as a not-for-profit limited company. Initially, Tom and Helen approached neighbours and local businesses and gathered support, bringing together 15 founding members who agreed to commit to an advanced order for the service and host a wireless access point, allowing the network to be built. The board of directors was drawn from this group. These members receive a reduced subscription in return for hosting the equipment. The lead members of SWBB see these as part of a more active group of members that will host equipment, and play a more active role within the initiative. Most of the decision-making is taken by Tom and Helen, with major decisions passed by the board. To get feedback from members, regular

surveys are carried out on a range of issues. The lead members believe the not-for-profit status of the initiative is well received within the locality, and helps both in business terms and local credibility. Subscribers have indicated that they support the idea of getting connected to the internet via a small local business that is feeding profits back into the local area.

SWBB also benefits from local antagonism towards BT due to the poor treatment local areas have received from the company, and several subscribers have indicated this was a factor in choosing to get connected via SWBB and not BT. As a small company in a small community, the group operates on a personal level and gets to know everybody they are connecting. Helen and Tom feel that this has helped increase social contact between people in the locality – people who are connected to the service get to know each other.

“...we’ve had people who have just moved into the village who didn’t know anybody and that have phoned up for broadband and have joined up to a network or another village and have made a network of friends” (Helen, South Witham Broadband 2005)

The initiative works closely alongside other community organizations in the area and it has developed close relationships with a wide range of local groups: for example one of its antennae is mounted on a local police station’s mast as the community police officer was keen to help out.

4.12.3 Knowledge and skills

SWBB has a core team of two members (Helen and Tom) and these are responsible for most of the work. Helen takes on most of the book keeping and fund raising while Tom takes on more of the networking. Additional help is provided by the directors of the company, and a number of core members who have taken on technical support roles. Interested in exploring new technologies; the group are currently exploring VoIP telephone services which would give members free calls within the network and cheap calls beyond the network. The initiative has purchased different types of equipment for testing the best service.

4.12.4 Collaboration and information sharing

The initiative is very active in collaborating both locally with other community groups and nationally with other networking initiatives and activists. Locally, the initiative works with a wide range of groups, supporting their activities through helping them with internet activities and services, which in turn helps bring in new subscribers.

The group is a leading member of the Community Broadband Network (CBN), which acts as an umbrella organisation and a political pressure group for the interests for community networking initiatives, and has been actively involved in their training and outreach from the beginning. CBN operates a mentoring scheme where experienced community networking individuals and groups can support new groups

starting up, and SWBB members have worked as mentors from the scheme's launch, helping other groups with technical and general advice. The lead members of SWBB noted that this was something they very much enjoyed, and that it has some crossover with their activities within the broader group of LocustWorld users, where they also provide advice and host other networkers, helping them getting started. SWBB is very proactive in undertaking external activities and seeking out funding, and as a result has a high profile nationally, and is in contact with many other networking groups. Their work is recognised widely, and they have been the recipients of several awards for their services to the local community.

4.12.5 Sustainability and lifespan

South Witham Broadband is based around a small core membership, and the lead members are very conscious that the initiative depends on their continued input to continue and grow. They have found it difficult to encourage the wider body of subscribers to take on more active roles within the initiative and become more involved with the running and the development of SWBB; most are interested in “just using” the network services. The initiative is run on more business like lines than many of the other grassroots initiatives, and the group is active in seeking grants and other community development funding. Currently there is enough income such that support call-outs can be charged to the initiative, so running it provides some income, rather than being a purely voluntary activity.

The initiative has been running for nearly three years at the time of interviewing and the team is keen to continue expanding and adding new services. They feel if it

became too much to manage it would be possible to scale back what they are doing and run basic services with much less effort for a longer time. Despite BT now providing local ADSL services, SWBB are still gathering new subscribers and have lost only 4 subscribers. At the time, they put out a survey to their members to see what they wanted from their initiative, and think that as they are a local company and offer personal service, this adds to their value and long-term sustainability even against major corporations:

"They (the subscribers) know if there is a problem 90% of the time Tom will get out on the same day and go and sort it out for them even if it's not to do with our network and I think that's the personal touch they really appreciate."

The initial cost of setting up a new connection (approximately £150) is still an issue for some potential SWBB subscribers. Roof top equipment has to be paid for (an antenna and an access point and cabling), and the team hopes that as they get more members on board they will be able to offer some subsidised connections with free or low cost equipment, and hence be able to reach a wider range of new subscribers.

4.12.6 Training

The SWBB team has developed a great deal of their expertise through practice. The team encourages new members to take an active role in the initiative, from helping establish their connection to the network through to participating in the running of the organisation and promoting its work across the local area. Informal training is provided to new members as part of establishing their connection, and they are encouraged to help maintain the service and to support their fellow members. SWBB also provides more formal training to members, both with regards networking and also content-focused skills. With a high number of members who run their own small businesses, often at home, SWBB is well placed to act as a hub providing skills training and formal sessions have been run, either using SWBB staff or through bringing in outside experts. These have included bringing in a web designer to teach members how to build their own basic websites, a digital photography class, video shooting and digital editing.

SWBB is also keen to further train its own staff, and as well as on-the-job training they are keen to put its team through certified qualifications where possible. The initiative has gained external funding for staff training, and sent three of the technical team on the industry standard Certified Wireless Network Professional training course. The lead members see this as a way of repaying core members for the time they have put into helping the initiative, and offering mutual benefits to all: the certification helps the members if they decide to take on freelance or consultancy work and also enhances the reputation of the initiative's work.

4.13 Digcoop

Digcoop is an initiative in London. The initiative connects two streets that form a housing association, and has been operating since 2001. Digcoop is significant as it is the initiative I helped develop, and it is from my work within Digcoop as a practitioner that this research started. The data was therefore collected in a more detailed manner than the other initiatives, including documentary evidence from the Digcoop archives, self-reflection, and ongoing interaction. However, to ensure consistency an interview was undertaken with lead members of the initiative.

4.13.1 Community

Digcoop is based in Hackney, East London. Digcoop operates within a housing association ('London Fields Solutions' also known as LFS) that covers 29 properties in two parallel streets. The two streets of Victorian redbrick terraced houses had been long term squatted, and in response to local council pressure to redevelop the area the occupants devised a regeneration plan to save their community. Funding was raised from a mixture of UK and EU sources, and the occupants were able to redevelop the properties, having agreed with the council that a housing association would be formed to manage the properties. The former occupants are now the tenants of the redeveloped properties, as well as the managers of the housing association. The properties were redeveloped and turned into multiple occupancy live/work units and flats. The community consists mainly of single people and couples aged between 25 and 45, with some small children. During redevelopment it was proposed to use ICT

to support community communications and the work of the housing association, and from this the networking initiative was born.

4.13.2 The networking initiative

Independently, myself and another tenant had come across the Redbricks Online networked community initiative, and proposed to the housing association that forming a similar network might be able to both support the work of the housing association and benefit tenants, through enhancing intra-community communications and offering low cost internet access. Many of the tenants are self-employed and use computers for their work and were interested in the idea of sharing the cost of accessing the internet, so the initiative was started in 2001.

28 out of 29 properties in the housing association have now been connected to the service, and over two thirds of tenants have signed up as members. The initiative provides a shared connection to the internet and houses its equipment in the housing association's office, and from here properties are connected via a mix of wired Ethernet connections and wireless 'backbones' to the further away blocks. Digcoop can be envisaged as four 'wired islands' connected to each other via wireless backbones, in a similar though more localised manner to East End Net. Members pay £6/ month for use of the service. The primary task of the initiative was to network the neighbourhood, connecting properties in response to requests for connectivity. Initially this took the form of stringing cables across roofs and between the blocks of houses but gradually this has moved to more long-term ducted cabling and wireless backbones. As the infrastructure of the network was completed the focus of the

initiative moved to exploring intranet services. Members of the initiative had already used the network to disseminate local information via email, such as minutes of the housing association meetings, however, the lead members of the initiative were keen to explore possible intranet services. The initiative is now focusing on development of such services: there is an intranet server with a content management system (Mambo) running news, a discussion board, a small ads server and a document repository. This will be discussed further in Chapter 6. Digcoop is run by a core team of four working on a voluntary basis. There is a shared bank account, but no formal legal structure, and the initiative is currently considering moving towards non-profit making company status.

4.13.3 Knowledge and skills

Most of the development within Digcoop is carried out by the lead members, with the wider membership participating on a more casual basis. There is a broad range of skills within the membership, which reflects the community's nature as a group of self-employed people that have led a regeneration of their neighbourhood. One of the lead members has accounting experience and is responsible for book keeping, while two of the others focus on the network infrastructure. There are several trades workers within the membership and they have led sessions when small teams have worked together to run cabling to new blocks of houses. The Digcoop membership tend to call on locally known experts to help resolve problems before approaching the lead members. The network is organised around the concept of 'block leaders' who collect subscriptions and act as point of contact for their cluster of houses. One of the lead members has taken on responsibility for developing the intranet, and is

also involved within the housing association, so has taken on the role of promoting services, and carries out training sessions with housing association committee members. As a result, the system has started to be used as a means of storing community information, and this knowledge is now being shared between community members.

4.13.4 Collaboration and information sharing

The Digcoop founders were inspired by Redbricks Online, and are in regular contact with other London-based networking initiatives. Regular social and technical meetings happen between the lead members of Digcoop, Consume, and Hive Networks (another East London group of wireless developers) and the Digcoop lead members attend local events such as the Wireless London “World Summit on Information Infrastructures”, the Dana Centre lectures and Architecture Association series of debates. Digcoop lead members have also helped set up another of the networking initiatives described, Mehetnet (Section 4.14).

4.13.5 Sustainability and lifespan

The lead members of Digcoop have been involved in the initiative since it was formed and are interested in continuing to participate as long as they live there. The lead members are aware of the dependency of the initiative on their input, and have been working to encourage wider participation within the membership. While there are several technically skilled computer users within the community, there has been

little enthusiasm by others to take on a formal role within the initiative and the lead members are considering ways to encourage greater activity. Beyond the core membership, there are a number of members who will take on ‘firefighting roles’ such as rebooting servers when the lead members are unavailable. One of the difficulties may be that residents are also required to take on an active role within the housing association as one of the obligations of taking up a tenancy, and so potential networking volunteers may feel that they are already committing time towards the neighbourhood. However volunteering for the networking initiative is seen as a valid role within the housing association and there is growing recognition of its importance for sustaining the community’s activities.

The lead members are currently considering formalising the initiative’s legal status and becoming a non-profit making company. This would enable the group to be able to apply for funding to enable investment into infrastructure, new equipment and staff training. One of the founders of the initiative has dropped out, and there is a concern that ‘volunteer burn out’ could become an issue, so the group is considering trying to find ways of paying staff. This might either be some sort of wage (such as a call-out fee) or paying for training courses that may help volunteers gain future employment or consultancies.

4.13.6 Training

Members are given basic network training when a member of the team connects them to the intranet and informal help after this. Currently, training is restricted to responding to specific problems. The intranet site is beginning to become a

repository of support information, such as ‘how to wire a connection’ and there is a rudimentary FAQ section. Between the members there is a high level of computer experience, including at least two software engineers, so members tend to support each other informally with experts providing support to novices: usually a neighbour is identified, for example, as “the Mac expert” or the network expert”. Lead members would like to offer training courses, and have polled their membership and found a desire for short (one day or less) courses, and this is one target for external funding. The housing association has a shared office and this would offer a useful space in which training courses could be run.

4.14 *Mehetnet*

Mehetnet is a wireless networking initiative in Hackney, London, connecting two streets. The initiative was formed after a chance meeting with one of the lead members of Digcoop, and works closely with a lead member from Consume. I became aware of Mehnetnet through my contact with the Digcoop developer, who put me in touch with the lead members of Mehnetnet. Data was collected initially through a lead member interview, but I then began to provide technical support and had greater access to the membership. This developed into a relationship that led to Mehnetnet becoming one of the two groups I worked with to explore the use of social software running within a local intranet (see Chapters 6 and 7).



Figure 4-10: Mehetnet area of coverage (© Crown Copyright/Digimap right 2010. An Ordnance Survey/ Digimap supplied service)

4.14.1 Community

Mehetnet supports two residential streets in Hackney. Mehetnet’s community within this inner city area is mostly middle class homeowners with a smaller number of younger professionals and working class residents. There is an active residents association which meets regularly to discuss local issues such as parking, rubbish and urban development. At one end of the streets there is a primary school, and a local church with attendant gardens. The local area has a variety of properties, from large Georgian townhouses to 1960s social housing blocks.

4.14.2 The networking initiative

Mehetnet was formed in 2004. The initiative was set up as a result of a chance meeting of a Digcoop lead member and one of the residents in the local area. This led to local residents' association members deciding to set up a community network and the Digcoop member being paid to help set up the infrastructure and train local residents. The network consists of a broadband connection into one house, shared across the community from a rooftop antenna to subscribers' houses via wireless access points. Originally this covered residents in two streets though one of the original members has moved to an adjacent street and is still able to maintain his connection. 15 houses with 2-4 residents each are subscribers to the initiative. Subscribers pay £4/ month and purchase their own wireless access point to connect to the network. The infrastructure is still being developed and has struggled at times to provide good service to all its subscribers. Digcoop put Mehetnet into contact with Consume and now one of the lead members of this initiative has started to provide additional technical support.

The initiative is arranged as an informal group, and issues are discussed at the local residents' association meetings. Within the initiative, approximately five of the members play an active role. One member who works in a technology orientated NGO acts as the lead technical expert and maintains the network (Anna). As well as discussions at the residents' association meetings, occasional Mehetnet meetings are arranged, and the subscribers use a mailing list to share information between each other. This was originally used for technical queries but has gradually evolved to being a community forum, where all aspects of local life are discussed (e.g. offer of

unwanted furniture, reporting an attempted break in, etc). The membership has been considering expanding their activities to include community networking tools, and this will be discussed in greater detail in Chapter 6, following.

Mehetnet is seen as a potential mechanism for encouraging greater community involvement beyond the residents' association's activities, with subscribers initially signing up for local and affordable internet connectivity but then being drawn into neighbourhood participation. There is current debate regarding the overlap between the residents' association (which covers a larger area than the Mehnet network) and Mehnet (which reaches some people who do not otherwise participate in residential association activities). There is also concern that using Mehnet as the primary means of community communication might exclude members of the residents' association who choose not to have an intranet connection.

4.14.3 Knowledge and skills

Mehetnet relies for its technical expertise on one main lead member, supported by a small number of active subscribers and help from Consume and Digcoop technical experts. The knowledge required to run the initiative is held and exchanged on mainly an informal level. The individual subscribers bring their outside knowledge and skills into the initiative, for example the lead technical member bringing her knowledge of wireless networking in from her paid employment, and the financial organisation being provided by a member who works in accounting. Skill sharing operates on an informal basis, with the lead members informing other members through face-to-face and telephone conversations, and using the mailing list. The

mailing list was set up at the launch of the initiative, hosted externally, so is used by subscribers both from their Mehetnet connection and work connections. This has proved useful as a mechanism for informing subscribers of current or future work, for example when the network ceased to function due to Cable and Wireless (their ADSL provider) losing connectivity across a large area of London for a few days.

4.14.4 Collaboration and information sharing

The lead members of Mehetnet work closely with other community network initiatives specifically lead members from Digcoop (which is based approximately half a mile away) and Consume. As has been noted earlier, members from Digcoop helped set up Mehetnet, and there is an ongoing support relationship. Mehetnet has drawn on the expertise of these groups, in some cases paying for technical support.

4.14.5 Sustainability and lifespan

Mehetnet is the smallest initiative interviewed, and lead members are very conscious of sustainability challenges. The network was set up with external help and though the lead members are gradually taking on more of the technical management of the network, the initiative still depends on outside technical support. The lead members aspire to take over all technical expertise in-house but this still is very much dependent on one of the members. The lead members consider the network as a community resource and see it as an ongoing element of their community infrastructure. As the cost of commercial broadband connections has dropped so

Mehetnet is having to work to remain financially competitive with other offerings, and is considering what other elements that would make them more attractive than corporate internet provision.

Mehetnet struggled initially to maintain its quality of service, with ongoing technical problems maintaining wireless services. This has had both negative and positive effects; on the one hand they have lost a few subscribers, but on the other hand this has made the membership aware that active participation is required to maintain service. This has resulted in additional members offering help and greater participation.

4.14.6 Training

As people join Mehnetnet, they are given advice on what equipment to buy, and the lead technical member visits and helps set up their connection. Training is given in getting connected to the internet, but there is little formal training beyond this. Support is provided informally by connected neighbours, and through the mailing list. The lead members of the initiative have considered setting up small training sessions in the future, but these have not yet happened. A community intranet is being planned (see Chapter 6 for more details) so the lead members anticipate running small group training sessions to help people learn to use the content management system and learn how to add their own content.

4.15 Summary

In this chapter I have undertaken a survey of grassroots initiated networked communities and reported on a sample group in further detail. I have addressed the following:

- found out the range and extent of community network initiatives, and specifically grassroots initiated networked communities (Aim 2 of the research)
- investigated the role and functionality of a selection of the grassroots initiated networked communities, identifying their goals, and objectives (Aim 3 of the research)
- identified the current use of social software within the communities (Aim 4 of the research)

A summary of the key characteristics of each of the group follows (Table 4-2).

Having interviewed lead members and gained an understanding of the grassroots initiated networked communities I will now turn to reflect on the findings and undertake an analysis of the groups. I will consider commonalities and differences, examine their key characteristics, and offer a typology of groups. I will also seek to draw lessons from grassroots initiated networked communities that may be applied in future initiatives and inform decision making at policy level.

	Redbricks	Yellowbricks	Consume	Backnet	Manchester Wireless
Scope	Housing association 150 / 250 houses connected Wired network Shared link to Internet	Housing cooperative 50 / 70 houses connected Wired network Shared link to Internet	Citywide subculture 80 users connected Composite wireless and wired network Multiple links to Internet	Citywide subculture 20 users connected Wireless network Multiple links to Internet	Urban neighbourhood 20 users connected Wireless network Multiple links to Internet
Technology	Users provide own computers Network infrastructure provided by initiative	Users provide own computers Network infrastructure provided by initiative Computer recycling scheme	Users provide own personal computing and network equipment	Users provide own personal computing and network equipment	Users provide own personal computing and network equipment
Autonomy	Unlimited access, usage moderated by traffic shaping software	Unlimited access, usage moderated by traffic shaping software	Unlimited access, usage moderated by traffic shaping software	Unlimited access, usage moderated by traffic shaping software	Unlimited access and usage
Skill	Range of computer literacies amongst users	Range of computer literacies amongst users	Mixture of early technology adaptors and domain experts	Early adopters of networking technologies	Early adopters of networking technologies
Support	Informal access to experts Workshops Drop-in centre	Informal access to experts Workshops Posters	Informal access to experts Workshops Drop-in centre	Informal access to experts	Informal access to experts Workshops
Purpose	Affordable connectivity Community information resource	Affordable connectivity Content sharing Umbrella support of wireless initiatives	Affordable connectivity Content sharing Experimentation	Affordable connectivity Umbrella support of wireless initiatives	Affordable connectivity Promotion and support of local networking initiatives
Current online services	Public website Mailing lists	Public website Mailing lists Wiki	Public website Mailing lists Multimedia servers VoIPphone service	Public website Wiki	Public website Mailing list IRC channel Wiki
Structure	Subscription based service Core of volunteers and wider group of end users	Subscription based service Core of volunteers and wider group of end users	Peer network of users with core of super users	Peer network of users with core of super users	Peer network of users with core of super users

	3-c.coop	East End Net	South Witham Broadband	Digcoop	Mehetnet
Scope	Valley area (two towns) 400 users connected Composite wireless and wired network Multiple links to Internet	Urban neighbourhood 80 users connected Wireless network Multiple links to Internet	Rural community 20 households connected Wireless network Shared link to Internet	Housing association 28 / 29 houses connected Wired network Shared link to Internet	Urban neighbourhood 15 households connected Composite wireless and wired network Shared link to Internet
Technology	Users provide own computers Network infrastructure provided by project	Users provide own personal computing and network equipment Network infrastructure provided by project	Users provide own computers Network infrastructure provided by project	Users provide own computers Network infrastructure provided by initiative	Users provide own computers Network infrastructure provided by project
Autonomy	Unlimited access and usage	Unlimited access and usage	Unlimited access, usage moderated by traffic shaping software	Unlimited access and usage	Unlimited access and usage
Skill	Range of computer literacies amongst users	Domain experts supported by early adopters of networking technologies	Range of computer literacies amongst users	Range of computer literacies amongst users	Range of computer literacies amongst users
Support	Informal access to experts Workshops Technical support centre	Informal access to experts Workshops	Informal access to experts Workshops Formal training sessions	Informal access to experts	Informal support
Purpose	Affordable connectivity Community information resource	Affordable connectivity Content sharing Experimentation	Affordable connectivity Community information resource	Affordable connectivity Community information resource	Affordable connectivity Community information resource
Current online services	Public website Mailing lists Discussion boards Help system	Public website Mailing lists Multimedia servers VoIP phone service	Public website VoIP phone service	Public website Content management system Discussion boards	Mailing list
Structure	Subscription based service Core of volunteers and wider group of end users	Peer network of users with core of super users	Subscription based service Core of volunteers and wider group of end users	Subscription based service Core of volunteers and wider group of end users	Subscription based service Core of volunteers and wider group of end users

Table 4-2: Key characteristics of studied grassroots initiated networked communities

5 Analysis of networked communities

5.1 Introduction

Drawing from the case studies in Chapter 4, I will now turn to an analysis of grassroots initiated networked communities. In Chapter 2, I identified that to bring a population online, rather than crossing a simple digital divide, multiple digital insufficiencies had to be addressed and re-addressed. I will now examine grassroots initiated networked communities and explore to what extent they may address this more complex set of barriers. I will summarise the findings of the fieldwork, identifying key similarities and differences, and offer a typology to better describe the phenomenon. Finally I will draw lessons from the initiatives that may be applied to future networking initiatives and inform decision making at policy level.

5.2 Overview of initiatives

I will first evaluate the phenomenon of the grassroots initiated networked communities drawing from the fieldwork reported in Chapter 4. I will consider how they may overcome multiple aspects of the digital divide, to what degree they are aware of each other's existence and work together, and they may be considered sustainable.

5.2.1 Addressing five dimensions of digital inequality

In Chapter 2 I identified that to bring a population online, multiple insufficiencies or inequalities need to be addressed, and re-addressed. In this section I will first consider to what extent grassroots initiated networked communities may be able to help local neighbourhoods address these insufficiencies. To do this, I will compare the groups against DiMaggio and Hargittai's five dimensions of digital inequality (2001):

- Equipment: the quality of computer hardware, software, and internet access
- Autonomy: the control an individual has over how they can use their connection
- Skill: the knowledge to make best use of the equipment and access
- Social support: to be able to draw on others to develop skills and overcome obstacles
- Purpose: to have meaningful reasons to be connected

I will then consider the interrelationship of the groups, how much they represent a communal activity, and finally, consider their potential for sustainability.

5.2.1.1 Equipment

Lack of a suitable computer or internet connection is a key insufficiency that policy makers often focus on when considering the digital divide: the device and conduit

model. Grassroots initiated networked communities address this barrier by sharing the cost of access across a large number of users. The cost of internet access is shared across the whole community, enabling one or more high-speed connections to be utilised at little cost per individual subscriber. While the cost of acquiring an internet connection has dropped significantly since Consume were asked for £40,000 for a single ADSL connection, the cost can still be prohibitive to people on lower incomes, and additionally requires the setting up and renting of a fixed telephone line, which may not be provided to those with limited or poor credit histories. Some networked initiatives resell broadband connections to their commercial clients (e.g. 3-c.coop and South Witham Broadband) which allows cross subsidisation and reduced connection costs to their private subscribers.

Networking hardware and software is communally purchased by grassroots initiated networked communities, which also reduces costs across the community. While an individual might need to purchase a broadband router, cabling and a wireless access point for their house, an initiative like Digcoop can provide connectivity to 50 subscribers through three access points and can get a discount on larger runs of cable. Hardware equipment may also be acquired more cheaply through bulk buying and then sold on at cheaper rate to subscribers, which in turn provides income to support the initiative (an approach taken by Consume).

In a number of initiatives, low-income subscribers are supported through the provision of free or subsidised computers. Equipment may be recycled within the neighbourhood and passed to other subscribers, and the acquisition of donated

equipment from outside the group may be brokered by a core team within the initiative and passed on to individual subscribers, such as in Yellowbricks.

5.2.1.2 Autonomy

DiMaggio and Hargittai emphasise the importance of autonomy; enabling people to engage with whatever resources they prefer, whenever and wherever they like, unhindered by restrictions. Access to the internet in the workplace is often limited by the employee's contract, and central public services such as libraries will limit access times and services available (for example prohibiting access to certain websites, or not allowing USB memory sticks to be loaded into the computer).

The grassroots initiatives emphasise the provision of network access to the home, and work to provide all subscribers with connections to their own properties. In several cases the initiatives provide additional access points in community locations to further ensure equitable and easy access across the locality. For example, Redbricks allows residents to use computers in the tenants association office connected to the network, and South Witham Broadband provide community connections in the local pub and village pub in South Witham (Annison 2007). While computing equipment is generally considered to be the responsibility of the individual members, several initiatives also aim to provide loaned, low-cost, or otherwise subsidised equipment to ensure this is not a barrier to members' autonomy.

Initiatives place minimal restrictions on usage, often only asking for subscribers to consider their community and be fair in their usage. The surveyed groups are

generally more tolerant in how the internal networks can be used than commercial internet service providers, often allowing the sharing of video and audio resources between subscribers and even supporting it through the provision of specific media servers for people to store their files. In some of the more experimental groups, unorthodox usage of the network is even encouraged, with the lead members keen for subscribers to explore possibilities, for example in Consume and East End Net. Most of the initiatives have an informal rather than written terms and conditions of usage agreed with their subscribers, and often individual subscribers are permitted freedom to do what they will on the network unless it will affect other subscribers (e.g. heavy peer-to-peer music sharing that slows down the network for others) or the community initiative itself (undertaking illegal activity or actions that will cause the internet service provider to close down the connection).

5.2.1.3 Skill

To fully benefit from digital access, people need to learn skills and continually improve their knowledge to fully utilise tools and services. By taking a community-based approach, grassroots initiatives draw from existing social relationships and help create new links between people at a local level, providing individual subscribers with a local network of expertise that they can turn to when seeking to achieve what DiMaggio and Hargittai term “internet competence” (DiMaggio and Hargittai 2001). Because the initiatives are operating within a defined geographical area, it is likely that the new subscribers will already have local social networks they can turn to that may include somebody with some computing skills, so as well as

having access to the core members, who invariably provide informal help in response to calls, new subscribers can also turn to their 'local experts' who live nearby.

All the initiatives interviewed undertake a skills assessment of their new members, providing informal help where required to set up new subscribers' computers so they could connect to the internet, talking them through the various services offered by the initiative, and how to best use these tools. The initiatives often have an explicit social agenda, and lead members in all the groups interviewed provide ongoing informal teaching to subscribers, and encourage interaction amongst subscribers to enable shared learning. Some of the initiatives offer more formal skills training: 3-c.coop has received funding from local authorities to provide computer training on common software packages, and Redbricks and Yellowbricks have hosted training sessions in collaboration with a local university to teach their subscribers to shop online safely.

The wireless networking groups, with members drawn together by their common interest in computer networking in itself, organise meetings specifically aimed at technical skills sharing. While a small number of members may lead these workshops, there is a general sense of community collaboration and an emphasis on mutual skill sharing. In such workshops members may demonstrate software or hardware they have built or acquired and teach others how to use it, and encourage its uptake, such as building antennae out of recycled tins, or upgrading commercial access points to run open source software.

As initiatives are based within communities that are in continuing local social interaction, the grassroots initiatives also offer their members the opportunity to receive further training and help when required. In this manner, initiatives are able to respond to the challenge identified by van Dijk and Hacker (2003) who note that skills change over time and hence insufficiencies must be continually readdressed.

5.2.1.4 Social support

Getting access to the internet requires social support; friends, workmates, and peers that an individual can turn to for advice about what equipment to buy, how to set up a connection, and are around when a problem arises. DiMaggio and Hargittai suggest that early web users were “embedded in dense networks of technically sophisticated peers” (2001) whereas more recently connected individuals may be more isolated.

A community-based initiative offers subscribers a social support structure; both in the initial phase of getting connected to the internet (and the local community network), and in providing ongoing support to continually re-address digital insufficiencies and ensure an individual stays across the digital divide. As well as support from the initiative’s lead members, an individual belonging to a local initiative is likely to be able to access informal assistance through neighbours. All the groups interviewed are based in relatively small geographical areas, with the core members living in the neighbourhood that the initiatives serve. Thus subscribers are likely to be in contact with the core members regularly through chance meetings in the local area, and are likely to share other social interactions with them. This also means that the lead members of community initiatives have a vested interest in

providing good service: if the network is not working, the lead members will also need it fixed.

Finally, community initiatives offer more socially tied, personal levels of support than commercial providers: several of the lead members joked that the local pub was their office, and neighbours knew where to find them if they needed help. This represents Bakardjieva's "warm expert" (2001): "...someone with technical competence who is in a position to help a new internet user. A warm expert mediates between the specialized knowledge and skills necessary to use the technology and the specific situation and needs of the 'novice' with whom the warm 'expert' has some kind of more personal relationship" (Wyatt, Henwood et al. 2005, p. 204). In this aspect, community-driven initiatives offer a value that exogenous providers will find hard to replicate.

5.2.1.5 Purpose

DiMaggio and Hargittai's final dimension of inequality that needs to be overcome is purpose. An individual may connect to the internet, but they need a reason to do so; if they do not find content that is of use or interest to them, they may then disengage (Wyatt 1999; Zhu, Taylor et al. 2003). Community-based initiatives work to bring a neighbourhood or geographically bounded community online, rather than individuals, and encourage social interaction in the locality as a fundamental aspect of their operation. By bringing a community online together, the initiatives connect people who already have shared interests, whether it is a work practice (multimedia arts, as found in East End Net), a shared interest (in networking technologies, as

found in Consume) or the neighbourhood itself (improving the area and organising against unwanted development, as found in Mehetnet and Digcoop). This gives the individuals an online community with which to converse, and a reason to interact.

All the community initiatives interviewed facilitate the sharing of common purpose by providing tools to enable social interaction, from the network infrastructure and access to the Internet through to additional social software tools ranging from mailing lists (such as “Act” and “Shout!” in Redbricks) through to forums, wikis, and more complex content management systems. By providing the means to easily communicate with a community of like-minded people, grassroots initiated networked communities provide a strong incentive for members of a locality to go online and stay connected.

5.2.2 Interaction between groups

Grassroots initiated networked communities do not operate in isolation, and most maintain regular contact with other groups. As noted previously, it is possible that there are isolated groups existing independently, however, given the nature of the domain, it is unlikely that there are any groups unaware of other activity. All the groups interviewed were aware of other initiatives through online social spaces, and the majority of the groups converse and share expertise with others. Invariably, all groups use online networking tools to keep aware of shared resources to support their initiatives viewing websites, mailing lists, and discussion boards to gather information.

Lead members are very likely to participate in wider, umbrella organisations, such as the Community Broadband Network and Consume, and attend networking events, both nationally and in some cases at international gatherings such as the Chaos Communication Camps held in Germany⁴³, and the World Summit on Information Infrastructures in the UK⁴⁴. The amount and type of interaction depends on the type of initiative. The more experimental technology focussed groups have a broader body of members attending umbrella events and communicating and visiting other groups, while in the more neighbourhood focussed groups it is likely to be only the lead members that participate in a wider network of initiatives, reflecting the goals of their respective memberships.

Some lead members may operate very actively at this umbrella level, forming in effect a global community of practice, utilising their own community network initiative acting as a local instantiation of their wider beliefs and activity. This approach can be seen in the work of Vortex, from East End Net, the members of Consume, and those of Manchester Wireless and Backnet. Often members of these groups will travel to see other initiatives, host visitors from elsewhere, and sometimes even move between groups. During the research fieldwork period, Rob Kyle from Manchester Wireless moved to Edinburgh and became an active member of Backnet, while Andres from Guadawireless in Spain moved to Manchester and became involved with Manchester Wireless. This is a highly international community which shares ideas and supports a sometimes nomadic membership, closely resembling the open source movement.

⁴³ <http://events.ccc.de/camp/2007/Home>

⁴⁴ <http://www.okfn.org/wsfii/>

Overall, I have observed relationships between initiatives to be positive; there is a sense of shared purpose and sometimes even a sense of common enemy, dissatisfaction with major telecommunications providers. However rivalry on a personal level can sometimes affect relationship between groups. Highly motivated individuals drive the initiatives, and on occasions opinions differ over philosophies, policies, or technical issues which might seem quite esoteric to outsiders yet are of deep importance to the participating individuals. This may lead to either groups breaking contact with each other or distancing themselves, and like in other domains, may lead to factions.

5.2.3 Are they sustainable?

While grassroots initiatives appear to address a broad range of digital insufficiencies within a community, they must continue to re-address these challenges over time. It is therefore important to consider how sustainable such initiatives may be.

The groups interviewed depend for the most part on volunteer input, are small in size, and rely on specific named individuals that are often founders of the initiative. In many cases initiatives are only able to function due to the ‘sweat equity’ contributed by members and would not be viable if expertise and staff time had to be paid for. This dependency on volunteers can mean that ambitions have to be curtailed, and initiatives may cease to exist when one or two highly active participants move on. One group drastically reduced its activity when a member left the area to go to university elsewhere, and in another, future planned developments

were put on hold indefinitely when a lead member had a baby and had to reduce the amount of support time they could offer. One of the major challenges, therefore faced by the groups interviewed is finding ways of encouraging a larger number of the subscribers to take up an active role in helping run their initiative.

The grassroots community networking initiatives are highly dependent on the social capital of their host community. It is clear that as well as generating social capital by their hard work within the community, the operation of a community network can also use up social capital, potentially reach a point where volunteer enthusiasm has been exhausted and the initiative would no longer be able to function. For groups providing network connectivity for a neighbourhood, this can mean possibly leaving the locality without means of connecting to the internet. For groups that have developed community services and encouraged members to contribute, such as discussion boards, mailing lists, photo galleries or local history archives, this can also mean the loss of a community memory if no strategy for the archiving and retrieval of the resources has been planned (Mulholland, Gaved et al. 2006).

Some initiatives - particularly the more technology focussed and experimental groups - may only see themselves as temporary, however, and be happy to disband as members move on, seeing themselves as analogous to Bey's idea of Temporary Autonomous Zones (Bey 1991). They may perceive themselves to have a single shared purpose, addressing a specific issue for a short period of time and be happy to collectively move on to other interests when the challenge has been resolved or is no longer of interest. The technology-focussed groups such as Consume and Backnet are less tied to a specific neighbourhood, and have a higher turnover of members,

often with a narrower demographic of younger single members. For groups more closely associated with a specific neighbourhood and integrated with existing social networks and organisations, such as South Witham Broadband, or Yellowbricks, a greater emphasis is placed on ensuring long-term sustainability.

Wenger proposes that communities of practice have a defined life cycle, from initial formation through to growth and maturity, and then archiving and dissolution (Wenger 1998), and it may be that this can be applied to grassroots networking initiatives. Wenger identifies that different activities occur at different stages of a community's life cycle and it may be that in order to be sustained over a long period of time, grassroots initiated networked communities need to find a number of different members to fulfil the roles, and that a small number of core members are not able to fulfil them all. This was witnessed in several of the groups, where lead members indicated their preference for particular tasks, and their challenges to find volunteers to undertake ongoing roles. Many of the groups had lead members who were passionate about connecting their neighbourhoods and encouraging and supporting the members of their communities in its use. However, there was less evidence of lead members whose specific responsibility focussed on administrative or managerial roles. In order to be sustainable in the long term – if this is the goal of the initiatives – then these broader roles must be considered.

5.3 *Types of groups*

The initiatives I have interviewed do not represent a single homogenous group. They exist in a wide variety of environments to overcome different challenges, and are run

and owned by a range of people with different motivations and goals. With the small sample investigated, it is not possible to propose a complex taxonomy, however the initiatives can be clustered into broad groupings. The initiatives are socio-technical constructions and they can be described through both their social and technical characteristics, so can be classified in a number of ways, drawing from the theories of community identified in Chapter 2.

5.3.1 By networking technology: ‘wired’ versus ‘wireless’

A simple division between the initiatives is the nature of their primary networking technology: how they connect their subscribers to each other and to the broader internet. The interviewed groups could be described as having either predominantly ‘wired’ or ‘wireless’ network infrastructures depending on whether they connect subscribers to the network using continuous Ethernet wired connections, which imply a more centralised, fixed location network, or by wireless radio connections. This characterisation of groups by their preferred networking technology has been used both by the initiatives themselves and academic researchers (Sandvig and Bar 2002; Camponovo, Heitmann et al. 2003; Sawhney 2003; Bina 2005).

The type of technology adopted may reflect the purpose of the particular initiatives, or the desired reach. ‘Wired’ networks are by necessity more constricted geographically, limited to how far cables can run (signals can only be powered up to 100 metres) while ‘wireless’ networks may be dispersed across several miles. Initiatives are pragmatic in their choices of networking technologies, and may move from one option to another to provide their members with the best services. South

Witham Broadband, for example, moved from satellite connectivity to ADSL broadband as the latter became available and offered better value for money (Annison 2007).

Groups connecting a particular subculture (such as electronic artists, in East End Net) are likely to have a more dispersed membership than those connecting an urban neighbourhood, and find wireless technologies preferential as they permit connectivity over a wider area. However a combination of technologies can also be found, with clusters of wired subscribers linked together over wireless networks, such as is found in Digcoop and East End Net. Generally, initiatives choose the technologies that are most suitable to serve their membership, however some initiatives are driven by a desire to explore new technologies, and the most pragmatic choice may not be the most interesting choice. During this research, I observed a higher number of cutting edge innovators exploring experimental configurations. The challenge of mastering novel technologies and techniques appeared to be as much a driver in these groups as assuring internet connectivity or building community.

5.3.2 By community type: practice, interest, and locality

Initiatives may also be classified by the nature of the community they support. While the primary goal of all groups is the utilisation of networking technologies to support social interactions within a community and access to the wider internet, the type of community served can vary greatly. We can view grassroots initiated networked communities as supporting one of the types of Willmott's definitions of community

(1986), described in Chapter 2, and unpack Willmott's 'community of interest' to also consider Lave and Wenger's more specific 'community of practice' (1991).

Communities of locality: Initiatives whose membership is primarily characterised by their shared residency of the same locality, closely resembling Willmott's "community of place" (Willmott 1986). These groups are defined by their physical locality and supporting a more disparate membership with more heterogeneous interests. The network infrastructure is seen as a means of broadening and supporting community participation. I would describe Mehetnet, 3-c.coop and Digcoop as communities of locality.

Communities of interest: Initiatives whose membership brings together participants from different communities to address a common interest: in this case developing and maintaining a network infrastructure to support their own practices. Brown and Duguid describe communities of interest as "communities of communities" (Brown and Duguid 1991) and I would describe East End Net as an example. Here, electronic artists participate because the operation of a networked community infrastructure allows them to communicate and further their practice. The initiative enables the sharing and broadcasting of audio and video files to a wider audience by the artists, and allows networking practitioners who achieve their goals of supporting such practices to satisfy their philosophical and political agendas.

Communities of practice: Initiatives whose membership is primarily characterised by a shared working practice. Communities of practice are defined by Fischer as "consist[ing] of practitioners who work as a community in a certain domain

undertaking similar work” (Fischer 2001, p. 68). The practice supported by the networked community initiatives is the exploration of networking technologies and their usage, with members seeking to be self-sufficient in their own technology provision. While the community will use the network and its services to support a wide variety of purposes, there is a playful, autotelic engagement (Csikszentmihalyi 1978) by the participants with the infrastructure technology itself. Members may be motivated to engage with the network for political or philosophical reasons or purely the pleasure of understanding how the technologies work. I would characterise the participants as the cutting edge ‘innovators’ in Rogers’ model of innovation diffusion (Rogers 1962). Consume, Backnet and Manchester Wireless would fit this categorisation most closely.

5.3.3 By commercial model

An alternative lens through which to describe grassroots initiated networked communities is by their commercial model of operation. While all groups have been set up and developed within the community, their approaches to financial sustainability vary. Bina and Giaglis (2004) differentiate “ad hoc community WLANs” from “commercial business(es)” by their use of a “community” rather than “commercial” business model and Verma and Beckman (2002) similarly distinguish between “for-profit wireless internet service providers” (WISPs) and “not-for-profit neighbourhood area networks” (NANs). However the study of the grassroots initiated networked communities suggests that while all are fundamentally motivated to support the members of their declared communities, a range of funding models is used.

All the initiatives interviewed face the challenge of financial sustainability, and they take a number of different approaches to resolving this problem. Some operate as local businesses, like South Witham Broadband, where the lead members aim to pay themselves a working wage, and perceive themselves as a community business enterprise. However SWBB also cross-subsidises profitable aspects of their business to support private and community subscribers, by selling on bulk-purchased broadband connections to local companies and using the profit to support community participants. Most of the initiatives work as unpaid volunteers with all profits being returned into the enterprise, and can be considered community initiatives, with a number legally instantiated as not-for profit organisations or charities. These include groups who take an active anti-commercial and pro-community stance such as Redbricks, which explicitly operates a “no-cut off policy”, never disconnecting non-payers. Smaller and more experimental groups work in a very ad hoc manner, either collecting money as and when they can from members, or like Consume, expecting autonomy and self-provisioning by members with no central costs passed onto the participants.

5.3.4 A simple typology: three types of initiatives

Bringing together these ways of classifying groups, I propose a simple typology of three types of grassroots initiated networked communities: Cooperatives, Subcultures and Pioneers.

Cooperatives are initiatives closely associated with a well-defined geographical area, supporting a community of locality. The primary aim of such an initiative is to achieve shared network connectivity for all residents within a neighbourhood to each other, and the broader internet. The main purpose of the initiative is to support social interaction between residents, and improving links from the community to further afield, supporting both bonding and bridging social capital. Subscribers join the initiative for affordable high-speed internet access and to communicate with their social circle, both within and beyond the neighbourhood. Supporting a local service is one of the motivations for subscribers choosing the initiative over a commercial telecoms provider. In Lazar and Preece's terms (1998), the users of this kind of networked community can be seen as highly bounded to the geographical community: interactions online match closely to the physical locality. I define Redbricks, Yellowbricks, Digcoop, 3-c.coop, South Witham Broadband and Mehetnet as examples of Cooperatives.

Subcultures are initiatives that support a community of interest within a defined locality. The primary aim of the initiative is to connect all members of the community of interest within a specific geographical locality. The main purpose of the initiative is to support the community's focus of interest within the locality, for example as electronic artists sharing resources over the network. Often the undertaking of the community's shared interest is dependent on network resources, and the initiative offers a service that is otherwise only poorly provided by commercial internet service providers. The subscribers are defined primarily by their shared interest, however their common locality is a common attribute that has

significance beyond that cooperative use of the network infrastructure, for example artists may share information about local opportunities, or use the network to promote their work or arrange social events. I define East End Net as an example of a Subculture.

Pioneers are initiatives that support communities of practice based around the exploration of new networking technologies and self-provisioning of network access in a specific locality. The primary aim of the initiative is to develop independent, autonomous network access for active participants who wish to manage their own network connections. Pioneer initiatives attract members who are interested in experimenting with new networking technologies, whether from a technical, philosophical or social approach (and often a combination of all of these). Like Free/Open Source developers, lead members of pioneer initiatives appear to be highly driven by “intrinsic motivation” (Lakhani and Wolf 2005), the undertaking of activity for its inherent satisfactions rather than for separate consequences, “working for the fun or challenge entailed rather than because of external prods, pressures, or rewards” (Deci and Ryan 1985).

This playful approach, drawing pleasure from the act of solving networking challenges as a goal in itself, can manifest itself in such groups exploring exotic or highly innovative technologies or approaches rather than using tried and tested solutions. These initiatives are primarily motivated by members’ shared interest in exploring networking technologies and the use they make of the network, and less defined by locality. Membership is dispersed across a greater area than in a Cooperative network, however the networking technology and the desire for face-to-

face meetings imposes a limitation on the size of the locality that is served. Pioneer initiatives are mostly made up of people at the leading edge of technological experimentation, referred to by Rogers as “innovators” (Rogers 1962). These groups fit well with Wenger’s definitions of communities of practice (1998):

- Mutual engagement in common ideas or practices: for the initiatives, the exploration of new networking technologies
- Joint enterprise as understood and constantly renegotiated by the members: seen in the initiatives through the mailing lists, discussion boards, and meetings where aims and goals are discussed and new ideas and visions proposed
- Shared repertoires of communal resources (routines, artefacts, vocabulary..): the initiatives construct hardware and software artefacts as part of their practice, and hold a shared philosophical approach to self provisioning of network access

The pioneer initiatives are also clearly “self-organising systems”, operating distinctly from other internet service providers within the locality. I define Consume, Manchester Wireless and Backnet as examples of Pioneers.

Key attributes of Cooperatives, Subcultures, and Pioneers are summarised in Table 5-1.

	Cooperatives	Subcultures	Pioneers
Organisational structure	Centralised	Decentralised	Decentralised
Purpose	Neighbourhood	Domain plus neighbourhood	Network within neighbourhood
Motivation	Community enhancement	Furthering practice	Experimentation, Play
Commitment to sustainability	High	Low	Low
Membership obligation	Subscription	Participation	Self-provision
Membership demographic	Broad (open to all in the geographical area)	Narrow (based on technical and /or domain knowledge)	Narrow (based on technical knowledge)
Examples	<i>Redbricks, Yellowbricks, Digcoop, 3-c.coop, South Witham Broadband, Mehetnet</i>	<i>East End Net</i>	<i>Consume, Manchester Wireless, Backnet</i>

Table 5-1: Key characteristics of the different types of grassroots networking groups

5.3.5 A layered model of initiative development

Studying the groups reveals a layered model of how the initiatives have developed over time. As networking initiatives, the groups have a clear commitment to the establishment of network infrastructures to serve their communities, while they are also driven by responding to their communities' articulated needs.

The network infrastructure is seen as an instrument to enable greater social interaction and political participation within the initiatives' host communities, as well as offering access to resources beyond it. Developing this infrastructure is seen as strengthening both bonding capital (intra-community relationships and knowledge sharing) as well as bridging capital (developing extra-community relationships and drawing in resources from beyond). On the other hand, the lead members are conscious that the initiatives should be driven by the members' communication needs rather than by abstract technical goals, and all place great importance on listening and responding to their members' requests. However, despite the rhetoric emphasising supporting community purposes, many of the initiatives are focussed on the establishment and consolidation of the network infrastructure, and fewer software tools and services are currently running than I expected.

On limited resources initiatives have to prioritise what they are able to do, and it seems likely that the establishment of a solid network infrastructure is required as a foundation on which to build further services. This was observed by Kavanaugh and Patterson in the Blacksburg Electronic Village; they report that little development of software tools was undertaken to begin with, and only when the infrastructure had

been developed sufficiently did further services develop and people consider how the network could be exploited (Kavanaugh and Patterson 2002).

This suggests there may be a layered model of networked community development, somewhat similar to Maslow’s hierarchy of needs, where one need can only be satisfied when a more fundamental need has been resolved. Stanoevska-Slabeva and Schmid identify that online communities “exist at the intersection of complex technical and social systems” (Stanoevska-Slabeva and Schmid 2001, p. 3) and apply Lechner and Schmid’s Media Reference Model (2000) to explore this intersection. This model (Figure 5-1) suggests the different ways in which an online community platform can be structured, focusing on commercial internet service provision, but it provides a useful starting point for considering the interconnected elements of a networked community initiative.

Community			
Processes			
Information	Supply Demand	Contracting	Settlement
ICT and Transaction Infrastructure			

Figure 5-1: Simplified view of Lechner and Schmid’s Media Reference Model (Lechner and Schmid 2000)

Drawing from this, it is possible to propose a layered model for networked community initiatives (Figure 5-2):

Community purposes
Community functions
Software tools
ICT infrastructure

Figure 5-2: Layered model of networked communities (Gaved and Mulholland 2004)

All networked communities need an *ICT infrastructure* to function, and once these have been established and secured then *Software tools* can be built / configured to support community functions, such as commercial transactions, seeking help, sharing resources, developing a community memory. These *Community functions* support overarching *Community purposes*. This model might be used to describe both externally and locally driven networked communities.

Reflecting upon the literature review, we can see that many externally driven initiatives drive this model from the bottom (ICT infrastructure) upwards, whereas grassroots initiatives may be prompted and driven from the top, by addressing community purposes and responding to these needs. However, initiatives must address all of these ‘layers’ to be successful and while they need to ensure the lower layers are well established to support the higher layers, the lower layers must reflect the community’s needs to be of use to a local neighbourhood.

This model may help to explain to some degree why little social software is in evidence and less community content creation was seen in the fieldwork phase of this research than expected. The need to ensure the basic infrastructure means that

content provision is considered by lead members to be a consequence of an operational network, and hence those groups who are still working to establish a sturdy infrastructure may have held back from expending significant resources to developing intranet services and community interaction tools. However the model shows that there are social as well as technological needs, and the community members are likely to view this model from the top layer downwards, and this must be borne in mind by lead members. Anderson has further developed this model to suggest that there is a disconnection between the approach of exogenous initiatives, and the goals of the communities they aim to support.

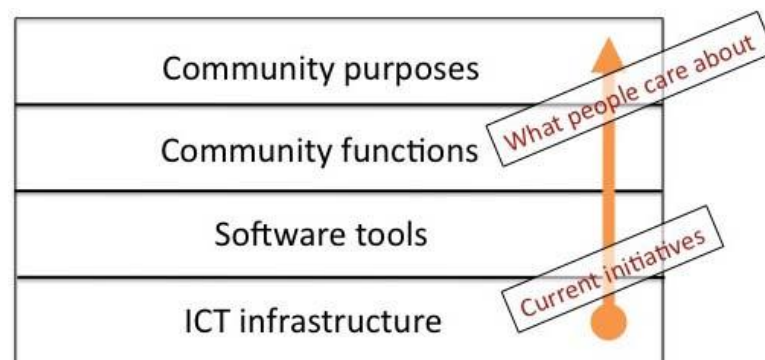


Figure 5-3: The citizen's value chain and the role of local ICT services (Anderson and Gaved 2006a)

The model also reflects that as an initiative develops, it must ensure that each aspect of its development is trusted by the members. Subscribers must trust the network infrastructure before they commit to using it for important purposes (for example, relying on the internet connection to be available so they can buy tickets online, or take an online exam). To move on to relying on tools within the network, or storing their information on the network (such as message boards) requires more trust again. Once the system becomes not only an information conduit, but also a community

memory then subscribers must make another step in their trust of the initiative's services as the loss to individual will be greater (Mulholland, Gaved et al. 2006).

5.4 *Lessons for networking initiatives*

The intention of this thesis is to provide useful research not just for the academic community, but also practitioners, so I now turn to the findings I consider valuable for lead members of networking initiatives. Looking across the analysed communities, I have found five factors that would appear to support the successful development of a grassroots initiated networked community, and I summarise these below.

5.4.1 Encourage sweat equity

The majority of the initiatives interviewed depend on a very small number of core members. Key skills on which the initiatives depend may reside in a single person, leaving initiatives very vulnerable to failure. It is therefore important that core members are supported by a wider circle of members who can act as 'apprentices' and gradually learn the central roles, undertaking a form of legitimate peripheral participation (Lave and Wenger 1991). Redundancy of expertise is required to ensure continuity in changing circumstances. Many roles can be fulfilled by the wider membership, such as providing informal support to neighbours, and specialised expertise is often found within networked communities (for example in grant writing). It is important that members are inspired to actively participate within the

initiative rather than treating it as a commercial transaction and only paying subscription fees. Social capital should be valued as highly as financial capital and ‘sweat equity’ needs to be encouraged. A wide range of skills is required to set up and manage an initiative, and lead members should consider what roles are required and how they might change over the lifespan of the initiative.

5.4.2 Maintain active connections to other networking groups

For small grassroots initiated networked communities, it may be difficult to achieve the level of expertise required to run all aspects of the enterprise. Smaller communities may be run by only one or two key activists, who do not have all the skills required. An important means of overcoming lack of expertise is to draw on external resources. In the short term this may be commercial expertise that is paid for, however this is not sustainable in the long term unless a high level of income can be guaranteed. A more sustainable approach that develops social capital is to engage actively with other similar networking initiatives. Lead members need to subscribe to key mailing lists, search out and actively collaborate with lead members of other grassroots networking initiatives, and join umbrella organisations such as the Community Broadband Network. These groups will be able to provide expertise; all the initiatives interviewed had drawn on the resources of at least one other initiative to establish themselves. As groups develop they can then share expertise and support new initiatives.

5.4.3 Ensure members' confidence

For most subscribers, participating in a local grassroots initiated networked community is a leap of faith: they are relying on the initiative's lead members to set up and maintain a service that has greater benefits than a commercial service.

Only once the service has proved it can offer a functional network will members use it for critical purposes such as banking or education, rather than treating it as an interesting but not necessarily reliable community experiment. Users may tolerate occasional network failures and 'downtime' while the network infrastructure is framed as a community experiment. However, once they become 'subscribers' paying for services and rely on it for paying their bills online, or handing in university essays, they will need to be confident the service will be as good as a commercial service. Trust can be won or lost on the provision of promised services. It is critical therefore that the lead members ensure a reliable service, and maintain a high level of communication with the wider body of members to ensure they are kept aware of all major decisions. This need for ensuring a consistent service and establishing the trust of the subscribers is even more critical if the initiative wishes to act as repository for community memories, holding community resources and sharing information that requires long-term storage (Mulholland, Gaved et al. 2006).

5.4.4 Capacity must be developed gradually

Echoing Maslow's hierarchy of needs, it could be argued that a successful networked community initiative must gradually build its capacity, layer by layer as described in Section 5.3.5 previously. While the goal of an initiative may be the sharing of community knowledge and increased community interaction, this may be dependent on a series of technical layers, such as ensuring reliable network connectivity, and establishing reliable intranet services. As each are developed, they must be well tested and established in consultation with the membership, in order to ensure that each layer can function properly and be trusted by the members. Training must be provided to the membership as each resource is established and its purpose communicated, and better still developed in collaboration with the wider membership, to ensure all aspects are relevant and support users' needs.

5.4.5 Leadership for each stage of an initiative's life cycle

As a networked community develops, so it needs to be supported, inspired and driven by a core group of members who will face the challenges presented at each new phase of its development. Initiatives will have a life cycle, similar to that described by Wenger (Wenger 1998) for communities of practice. At each stage, there needs to be a core team who will be able to maintain and develop the initiative.

The majority of the groups I interviewed have as their leading members individuals who helped found the initiatives. The motivation and skills of these people provided

the vision and impetus to establish the initiative, however they may not have the skills or the interest to manage the initiative as it moves from its pioneering phase through to a more mature phase in its life cycle. The initial skills required may have been around the ability to inspire a community and technical innovation whereas a more mature initiative may have greater need for a core team who are enthusiastic about user support, training, financial management and systems management. At each stage of the development of the initiative different skills and experiences are likely to be needed and it is important for initiatives to recognise and plan for these transitions. It is clear from some of the groups interviewed that initiators of a networking initiative are not always inspired by managing its continuing maintenance and may in some cases seek other challenges once their initial goals have been met.

5.5 Summary

In this chapter I have analysed to what extent grassroots initiatives may help communities overcome digital insufficiencies and cross the digital divide, using DiMaggio and Hargittai's five dimensions of digital inequalities as a structure. I have identified the key challenges initiatives faces, and proposed a typology to classify grassroots initiated networked communities. I have identified a range of activists and identify three broad groupings: Pioneers, Subcultures, and Cooperatives.

- Pioneers are explorers, investigating the cutting edge of new technologies. Often motivated by a desire to play and to set a broader agenda, they

represent a technological elite who may move onto the next innovation as it emerges.

- Subcultures represent a specific demographic within a locality drawn together by a shared interest defined by geographical area and moderated through technology. Membership, like the Pioneer groups, can be highly fluid.
- Cooperatives tend to be highly centralised and emphasise service to a broader community. They have a high commitment to long-term sustainability, and geographically narrow but demographically wide membership. They strongly identify with a specific locality and are highly embedded within it.

Finally, I have identified recommendations both for initiatives themselves to support successful development of such initiatives in the future.

In the next chapter, I turn to the second phase of the fieldwork, working alongside two groups to set up social software. Having identified there is little current use of social software within grassroots initiated networked communities, I undertake a collaborative development with two groups to understand the challenges involved with establishing intranets with tools and services, and observe the usage by community members.

6 A collaborative deployment of social software with grassroots initiated networked communities

“I’ve got too many friends”

“Facebook?”

“No, those are just people I like”

(Overheard by author in Split Airport, Croatia, August 2009)

6.1 Introduction

In this chapter I consider how social software might play a role in supporting social interactions within networked communities. I describe the second part of the research project fieldwork, exploring the use of social software working alongside two grassroots initiated networked communities.

6.2 Social software in community settings

In Chapter 2, I provided an overview of social software. To recap, social software is “software that supports group communication” (Shirky 2003) and can be defined as being software built around one or more of three premises:

1. Support for conversational interaction between individuals or groups - including real time and ‘slow time’ (near synchronous) conversation, like instant messaging and collaborative teamwork spaces.
2. Support for social feedback - which allows a group to rate the contributions of others, perhaps implicitly, leading to the creation of digital reputation.
3. Support for social networks - to explicitly create and manage a digital expression of people's personal relationships, and to help them build new relationships (Boyd 2005)

Originally focussed as tools for building virtual communities and supporting workplace interactions, social software has become more widely established and is now becoming used to support local, proximate communities. The development of social software has accelerated rapidly over the duration of this research work: in 2003, the tools were limited in scope and range to the CSCW community and hackers and early electronic innovators. At the time of writing, the range of tools and their take-up has exploded into widespread usage and media coverage. Such tools as Facebook, Twitter, Flickr, and MySpace are widely used by a much broader demographic of internet users. However in many cases these tools are used to support what Wellman calls “networked individualism” (Wellman 2002), personalised networks related by common interest rather than by locality. The increasing interest in social software tools by a wide range of researchers, journalists and policy makers reflects the increasing complexity of discussions surrounding the

idea of what a ‘networked society’ might be, however, there is still little analysis of how ICTs might support communities of locality.

The interviews described in Chapters 4 and 5 clearly indicate that this is a topic debated amongst grassroots initiated networked communities. While a primary motivation for many of the groups is to achieve sufficient quality internet access at affordable prices, external challenges and local ambitions have driven most to consider how they might offer a broad range of online services to their host communities. Interviewed lead members described a wide variety of services that they were either currently offering or considering implementing on their networks. A common goal is to draw together and enable the membership rather than bringing in an external audience. Tools described as being of possible interest are often those designed for virtual communities of geographically disparate networked individuals, or workplace groups, and consideration has been given on how they might be appropriated for use within proximate communities.

However, these tools have only been used to a limited degree by the groups interviewed in the survey. As part of the overall research, I wanted to explore what role social software could play within these initiatives and understand the factors that might lead to their successful adoption (Aim 4). The low take-up observed in the communities I had interviewed offered an opportunity to work alongside one or more of the groups to achieve this aim. Addressing Aim 5 of the research, I sought to undertake this work through a participatory approach, working as an equal partner alongside the practitioners, rather than replicating the top-down intervention style undertaken by many previous networking projects. The aim for the research was to

attempt to develop an approach for undertaking participatory research that could inform further practice and research, and I felt this could best be realised by attempting the work itself and then reflecting on outcomes achieved.

6.3 *A collaborative deployment with two initiatives*

6.3.1 Introduction

The aim of this second part of the research was to work alongside one or more of the groups identified in the first part of the research, building on relationships already formed, to implement social software within their networks and monitor its usage. The goals were to achieve a successful implementation of social software tools and services within the communities, and to identify what factors had led to their effective uptake. First of all I will describe how the initiatives were selected, and reflect on the methodological approaches taken. I will then describe the work undertaken, and finally reflect on progress made.

6.3.2 Selection of initiatives

I planned to draw a sample from the groups interviewed in the first stage of the field research. The interviews had required a gradual building of rapport with the groups' lead members. Making contact and developing trust took a long time and it made

practical sense to build on these relationships rather than having to establish relationships from fresh with new initiatives for the second stage of fieldwork.

In the first stage of fieldwork I had only requested if the lead members would give me time for an interview, so renegotiation of access was required if I was to work alongside initiatives for an extended period of time. This was a greater demand, and some groups were already suffering from “research fatigue” (Moore 1996) having already worked with other academic researchers, and were not keen on extending the collaboration beyond the initial interview. For example, the Redbricks lead members had already joked when I came to them that I was lucky to be given some of their time as they had had other researchers, media crews, and “busloads of MPs” visiting and asking them questions.

With a limited number of potential groups to select from and a finite time to gain access, the methodology for choosing groups for a case study became quite straightforward for very pragmatic reasons such as guaranteed access, as Yin (2003) notes. From the ten groups approached in the first part of the research, I sought to identify initiatives that were at a suitable stage of their lifecycle, with a stable network infrastructure, and had plans to explore social software. Some of the groups had already implemented tools (e.g. 3-c.coop), while others had experimented and discarded tools and had indicated they were unlikely to explore further tools in the near future (e.g. Redbricks).

The number of case studies to pursue was an important issue to be resolved.

Multiple-case studies can require extensive resources and are more complex to

manage (Yin 2003), and it was likely that the field work would involve multiple visits and an involved relationship that I would have to manage within a limited time frame and resources. One initiative had already agreed to participate, Digcoop, the group that I had helped set up and continued to work within as a practitioner. However my existing relationship meant that at least one further initiative would be required for comparison, to enable me to identify at the conclusion whether my relationship had biased the results. The first choice for a second case study was an initiative that had been very welcoming during the interview stage. However the group did not respond to requests, so a third choice had to be made. I settled upon Mehetnet, who are similar to and geographically close nearby Digcoop, providing a comparable environment, and were happy to work with me.

6.3.3 Research methodology

I undertook the case studies drawing on participatory research methods, inspired by the work of community informatics researchers such as Randy Stoecker (2005). By involving the community in the choosing and implementation of tools, I aimed to enable a community driven and owned solution, that would make effective use of resources and be more sustainable in the long term. I intended to offer my time, resources and technical experience in exchange for being able to report on the process and the uptake by communities. The lead members were aware that I was undertaking this work as part of a PhD programme so the ‘pure’ participatory research approach, where the decision making and timetable of activities would be collaboratively agreed or led by the host community, could potentially be affected as I was bringing outside goals to the venture.

My initial intention, devised in the research planning, was that the theoretical perspective developed as a result of surveying groups would inform which tools were most suitable for deployment. However it had become clear that communities were appropriating tools in unexpected ways, and a deterministic approach would bring little reward. Therefore the first stage of the collaboration was to arrange initial meetings with the groups and listen to what they felt were their needs and purposes, and what they wanted to deploy within their initiatives.

In both groups lead members were keen to draw in opinions from across their membership, so focus group meetings were arranged as the means of gathering data. As Gibbs notes, focus groups are particularly suited for gaining shared perspectives and provide insights that may be drawn out through interactions within the group (Gibbs 1997). These also enable a researcher to gain a larger amount of information from a group than would be possible in the same time from individual interviews.

Based on these meetings, I would draw up a summary of the discussion and agree key points with the lead members, identifying resourcing needs and suggesting a short list of likely tools for them to choose from. I would then work alongside the lead members of the groups, implementing the chosen proposed solutions, monitor the usage of the tools within the groups, and determine what impact these had on the community.

6.4 Digcoop

The first group to be reported on is Digcoop, the initiative I had been involved with as a practitioner before undertaking a PhD studentship. I will describe the process undertaken, the collaborative development, and the usage of the software once established.

6.4.1 Introduction

I had been one of the founder members of Digcoop and had lived in the host neighbourhood myself for 2 years before starting my PhD, and had continued to support the initiative. By the time I began this stage of the research, Digcoop had established a stable network providing internet connectivity to forty residents in 28 out of 29 of the properties in the London Fields Solutions (LFS) housing association (the final property was being redeveloped). Digcoop provided technical support for the housing association's office, and in return was given office space for its networking equipment.

Digcoop had planned to offer more than just shared internet access since its inception, announcing in early publicity releases to support the activities of the neighbourhood by providing tools to enable social interaction. The host community is a highly elective community, and the majority were the original residences of the properties from when it had been a squatted neighbourhood. This core group of residents had gained external funding to redevelop the properties in response to local

town council attempts to have them removed and the buildings demolished. Their actions had become a cause celebre with coverage in local papers and the London Evening Standard. The community has a very strong sense of self-identity and high levels of bonding capital, and reacted favourably towards the original proposal to create a neighbourhood wide community network.

As a prerequisite of being a tenant in the properties, individuals had to commit to participating in the housing association's work, labouring on the secondary construction of the properties (seen as 'sweat equity') and sitting on one of the organising committees (e.g. Building and Maintenance, Finance, General Purposes). The coordination of these tasks had led to a bureaucratic overhead. A shared community network offered a potential solution, and the construction and maintenance of the network itself was recognised as valid sweat equity.

6.4.2 Process

Digcoop lead members had been aware of my intention to undertake social software research since the beginning of the PhD study and so the process of agreement had already been decided in principle and details were negotiated informally over an extended period of time. The plan was worked out during a number of Digcoop development meetings. These are informal gatherings usually undertaken when members come together to carry out maintenance and development work on the network itself. I offered the following proposal:

- To provide a loaned computer from the Open University to host the chosen intranet set of tools and services, placed inside the Digcoop network
- To help facilitate focus groups and meetings to identify and agree on community priorities for services
- To help research possible software
- To help set up and manage the chosen software, working alongside the Digcoop lead members

Reflecting on the research I had carried out within the PhD literature review, I felt that it was important that the knowledge of how to set up and run the system would be held within the community rather than by me in order to ensure its longer term sustainability. I was keen to avoid creating an external dependency, and for the lead members to take on ownership of the system. I also needed the lead members to champion the services to the local community.

This proposal was received well, and I began the collaboration with the community. This consisted of focus groups with the members, who had a range of prior experiences of using software tools and were interested to be involved, and the identification of champions who would take responsibility for the development. One of the lead members, Tony, was particularly interested to learn how to set up and run content management systems so he was appointed to lead the technical development and coordinate between me and the wider membership (e.g. arranging meetings, reporting feedback). I would support Tony, manage meetings, document and report back decisions taken and provide support to Tony. I would also log the development process and collect data on usage.

6.4.3 Initial development

Tony was keen from the outset to learn a content management system that he could apply in his freelance work as well as use in Digcoop. He therefore began to research possible tools from the start, so rather than focus groups followed by technical research, the two processes of community debate and technical fact-finding proceeded in parallel. Each informed the other on an informal basis as well as being brought together at set points in a more formal meeting setting.

Tony's first task was to identify a system that could support the functionalities identified by the members as being of value to their interactions. The group had a clear preference for an Open Source system; all their current networking equipment was running open source software for practical reasons: it was free, and could run on the older computers that ran their network. Tony carried out his own research as well as taking on resources and links from my literature search, and decided on Joomla. He would develop the underlying system, collaborating with one of the active members of Digcoop who was a web designer. I had originally intended to run a comparative demonstration of different content management systems to the lead members of Digcoop and from there move to an agreed selection, but in the interim, Tony's research had brought him to his own independent choice. While this altered the proposed research trajectory, it reflected the practical reality in which I was working; the development of the network was not happening as purely an academic research exercise. Tony and the other Digcoop subscribers were balancing their participation in my research with their own goals.

As we explored Joomla further, Tony took the decision to change to an alternative content management system, Mambo, Joomla's predecessor. Mambo had a more established set of tools and services, and a large and active online user community, so presented a more stable option with less potential problems and a wider support group. We had often joked that Digcoop made a virtue of being behind the times, aiming to provide a less cutting edge yet more tested and stable system, as reliability was of greater importance to the members than the latest tools.

Tony and I loaded a linux operating system onto the Open University donated computer, which I then handed over to Tony, and he installed the Mambo content management system. The Digcoop network firewall was then configured to enable me to be able to access the new server from the Open University in Milton Keynes so I could continue to collaborate remotely on the development of the services. Much of the work and discussions to this point had taken place face to face, but this required me to travel 2 hours in each direction, which limited collaborative development to once a week. Setting remote access to the server, combined with Skype, email, and telephone contact enabled continued co-development to continue between the face-to-face meetings.

Having set up the server, we discussed the tools that the subscribers might like to see implemented within the content management system. The shortlist of possible tools we drew up was:

- News: notification of new events within and outside the community

- Calendar: important community dates and events, e.g. housing association meetings
- Noticeboard: for buying and selling, events notices
- Password protected area for LFS members only. The Digcoop network was accessed by both members and non-members and the lead members were keen to have an area where private matters could be discussed (e.g. housing association business)
- Indicators for network status: icons to note if the network was alive to the outside world – a common help request from members was to enable them to connect to the internet and we were keen to help members self-diagnose the problem.

The shortlist was informed by a series of individual interviews I had undertaken with individual subscribers as part of my first analysis of Digcoop (see Chapter 4). I had taken a sample of the membership and asked their opinions of the initiative and how they would like to see it developed.

While Tony was keen to go ahead and configure these tools, he agreed that the participation of the broader membership was required to make sure we were addressing members' formally expressed needs and desires. We contacted subscribers in three ways: face-to-face invitations, through the newsletter that Digcoop posted around the neighbourhood, and via email. Face-to-face invitations were made by Tony; a combination of targeting specific active subscribers we felt would offer important input, as well as more casual 'spreading the word' to friends and neighbours as part of everyday neighbourhood interactions. This informal

interaction is how a great deal of LFS and Digcoop 'business communication' was undertaken in general.

6.4.4 Focus group meeting with community

A meeting was organised in the local pub, at the end of the two streets where the residents lived, and had a beer garden so people could bring their children. Picking a familiar, local place was more likely to result in a greater turnout, and ensure a more relaxed atmosphere, hopefully leading to people feeling more comfortable about expressing their opinions (Krueger 1994). I was keen we should meet on the 'community's territory' rather than 'my territory'. The pub had a history of being the location to which the formal housing association meetings retired to once business had been concluded and less formal matters were casually discussed.

I chose the 'focus group' format as a means of gathering information for both pragmatic and methodological reasons. Practically speaking, drawing the members together meant that I could gather a larger number of opinions more quickly than if I had carried out individual interviews. From a methodological stance, I was interested to find out if the interaction between the members in the group setting drew any further information; if this interplay would spark conversations that might not have occurred in a one-to-one interview situation with me. Furthermore I was interested to find out if a shared consensus would arise by gathering ideas and opinions with the members as a group (Gibbs 1997).

In the event, we had a turnout of 9 people, representing approximately a fifth of the subscribers. Other members also noted their interest in the process, and had spoken previously to Tony, or emailed their thoughts in advance of the meeting, so these ideas could be brought into play as the meeting progressed. I opened the meeting by reminding the attendees of the purpose of the meeting: we were keen to expand the network to include intranet services, as these had been talked about as desired since the beginning of Digcoop but not actively pursued, and that we were looking for subscribers' input to make sure what we implemented would be driven by their needs rather than our expectations. To begin with, the initial responses by attendees were technically focussed. My impression was that they were seeking to respond to what they considered was a technological agenda with technically oriented responses: perhaps they were trying to give me the answers that they thought I was looking for. The initial requests were for tools that could support the members' internet activity, for example help guides to give people a greater technical understanding of how to get the best out of the network and the wider internet, how to avoid pop up advertising, and software services to reduce spam. The participants were framing their responses in an abstract technological sense, thinking about the limitations of the network and how they would improve it.

I responded by noting that I was interested in how the network fitted into their every day lives, and was interested to understand how the network might support those social interactions, and that while the technological improvements were important, I wanted to understand what purposes the network was used for by them. We were keen to draw the conversation towards more general community focussed issues, outside of the network itself. Tony led by suggesting a specific area for children

accessing the network, and a tool to help people match up with others to exchange babysitting; he and his partner were expecting a child and within the community there were perhaps half a dozen households with small children. This was a useful catalyst and drew in other comments in the same area: another participant mentioned “finding out who’s around when you’re stuck in with the kids”, being able to instant message each other, also to know who’s around (presence indicator) and find out if somebody else wanted to meet up and have a cup of tea while the children played together.

This use of instant messaging tools raised an interesting line of debate that had been touched upon previously in the individual interviews I had undertaken with members of the community. Some of the more technology-enthusiastic participants were keen to replicate internet tools such as MSN messenger and Skype on the internal network to bring as many web communication tools, both synchronous and asynchronous, to the local network. Their opinion was that these would operate faster over a local network, and would operate regardless of whether there was internet connectivity, which would potentially allow Digcoop to offer a cheaper ‘intranet only’ subscription service as well as the ‘internet plus intranet’ offering and so reach out to the lower income members of the community.

Discussions about community communications channels had happened previously in the housing association independently of the Digcoop network; the tenants had originally explored the possibility of setting up a local telephone exchange so all calls between the households were free, similar to an office network. This plan had fallen through but it was still a popular idea. Other members however, were deeply

sceptical of implementing internet-like communication tools within the local network. One member jokingly raised the common fear “we’ll all be sat in our own homes next door to each other talking via computer” and there was a sense that the majority of people felt that such tools would be little used as they believed existing communication channels (talking and face-to-face chats) sufficed. One member noted “...if I want to chat to my neighbours I’d rather pop around for a cup of tea”. There was a pragmatic attitude to the intranet and network communication tools; on the whole people felt they could communicate well enough but they believed that the network enabled some forms of communication to be carried out more effectively. One example offered was sharing photos amongst several neighbours, seen as more easily done via email than taking the photos round to show each person or producing multiple paper copies to hand out.

Information sharing at a local level was seen as a useful potential development for the network. Despite a high level of community interaction, the intranet was seen as potentially enabling people to more effectively put up notices to inform others of what was going on, as there was a concern that sometimes it was difficult to pass a message reliably round the whole community of nearly 50 tenants. The asynchronous and more permanent nature of an online noticeboard was seen as an attractive tool and possibly more effective than the current methods of face-to-face conversations and notices posted through letterboxes.

Four types of information sharing via the network were proposed by the focus group:

- Contact details for local neighbourhood services – such as call out numbers for the council to remove rubbish, the gas board, emergency plumbers, official contact numbers for the LFS representatives and Digcoop technical team
- Communications from LFS and Digcoop to the tenants and network subscribers – such as minutes from meetings, alerts to building work, information about the computer the network (e.g. downtime for maintenance)
- Postings from individual subscribers on a community noticeboard: items for sale or exchange, requests for the loan of articles, notification of parties and other local social events in the neighbourhood
- Local resources: music and video library, local webspace for people to put up their own content

The participants noted that they'd tried other means to fulfil these purposes but with varying success: for example the council website was noted as being hard to navigate, and Freecycle, an internet based national community exchange tool, was noted as being too cumbersome to use and not local enough in focus.

The discussion about providing information for subscribers raised an important point: not all Digcoop subscribers were members of the LFS housing association, as the network also provided connectivity to neighbouring residents who were good friends and seen as part of the local community and hence had been connected to the

network. This raised the issue of how to deal with information that was private to LFS members, and it was agreed a private area for these members would be required. It was felt that information such as minutes of the housing association should only be accessible to LFS members and not the whole Digcoop membership. Equally, there was concern that to move LFS information onto the intranet might disadvantage LFS members who were not online and participating in the Digcoop community network, so participants asked whether it would be possible to offer intranet only access (without internet access) to some LFS members who hadn't subscribed to the Digcoop network on grounds of cost, and investigate if it was possible to offer a cheaper or free service to them.

This identification of overlapping communities was further raised by the desire of the participants that people seen as members of the local community but since moved to other localities should be given access to the intranet. Since the housing association had been formed, some residents had moved elsewhere in London and others had moved to a village in Norfolk, but in both cases they were seen as active, contributing members of the community who should be offered the opportunity to access the intranet so they could keep abreast of community activities. The participants asked that the intranet should be set up to allow remote access to these community members. On the other hand, participants were not in favour of a publicly available website to promote the housing association and its activities. Participants were happy for the Digcoop technical team to have an external web presence to announce its activities, but the members felt that no promotion of the housing association itself was desirable. As an innovative housing scheme the group

had received local and national press coverage and already had a long waiting list for future tenancy places and did not want to court further attention.

Having drawn together a list of potential tools to be developed, the meeting participants agreed that the lead technical members should undertake initial development and then present the services to the Digcoop subscribers for testing and subsequent implementation. One member noted his concern about making sure that anything set up could be sustained; the network relied on a small number of active members and it would not be useful to set up services and encourage people to use them only to have them shutdown soon after. It was agreed training would be needed, and documentation on how to use and support the services.

6.4.5 Setting up and implementation of services

Having been given a list of potential tools and services at the focus meeting by the members, Tony, as lead developer in Digcoop, worked on installing these services on the intranet server. The Mambo content management system has a default range of tools that can be activated, and a thriving user community producing further third party tools and services, so installation and configuration was reasonably straightforward and most of the requests made by the members could be addressed. In some cases more than one version of a service had been created by different developers, such as a small ads tool, and Tony installed alternative versions for comparison and testing. We undertook a short period of testing with a core group of active subscribers, priming the tools with initial content. For the wider membership, being presented with an empty tool might be daunting, and there might be some

confusion in what sort of content should be added. By providing examples, the tool would be 'framed' for users.

The services launched on the intranet were:

- Home page: providing an introduction, and news headlines
- Network status icon: indicating whether the network was connected to the wider internet, represented by 'traffic light' status indicators
- LFS Talk - forum
- Events – where people could post events
- Contacts – Digcoop network information
- News stories
- Info – local information
- Traffic graphs – internet traffic
- Calendar
- Login: to allow limited guest access (Digcoop members who are not tenants of LFS) and login to LFS tenants only area
- Intranet search
- Google search
- Small Ads (launched after than the other services)

Setting up and running a music and video server was an issue that we spent a lot of time thinking about. Clearly, there was a heavy demand for this content within the community, and indeed peer-to-peer music sharing had brought the network to a standstill on several occasions, leading to irate phone calls from subscribers asking

why the internet connection wasn't working. The asynchronous nature of our network connection (ADSL) combined with external requests for access to Digcoop subscribers' music collections had effectively killed the network more than once, so the idea of setting up a purely local sharing service and asking subscribers to deny all requests from external peer-to-peer sharers was very attractive. However we were concerned about the legal implications, and as Tony had meanwhile researched how the network could be better configured to reduce requests, and another subscriber had identified a software package that would schedule downloading to quiet times, we decided to promote this as an alternative strategy.

After the most active 'core user' members had tested the services and added priming content, the services were launched to the wider membership by a mail-out via email, newsletter and word of mouth. The original intention had been to launch with a training session, and make the launch itself into a community event, but external commitments had rendered this difficult, and we decided to forego this in order to get the services live.

6.4.6 Usage

Initially, the intranet pages were well visited as there was a great deal of curiosity both by the focus group participants and the wider membership. Contact details online, and local information were well received, and particular use was made of the traffic graphs tool that allowed subscribers to identify quieter network times. Until this point, members had not known when the network was busy and when the regular quiet times were, and some frustration had occurred at peak times when everybody

attempted to carry out downloads and slowed the network down to a halt as a consequence. Providing upload and download graphs drawn from the firewall allowed subscribers to regulate their usage, and this noticeably helped reduce frustration. ‘Traffic light’ style icons indicating current state of the local intranet and external network access and presented on the Digcoop intranet home page were also well used by the membership, providing a simple visualization of network status.

The lead members posted LFS housing association and Digcoop specific news, such as building work and service notices, though these were less frequently read and lead members found that they had to continue notifying the subscribers of events through the existing channels of communication. Despite several requests for the service, the small ads tool was little used, with only one occasional poster, and never took off as a service. Similarly, subscribers seemed reluctant to post messages about up and coming events in the calendar tool despite some initial content being posted by the lead members.

More successful though was the forum tool, allowing members to post conversation threads. Initially this had been envisaged as an informal chat and debate space for social interaction, and as a feedback mechanism where people could put up ideas on how to develop the Digcoop services. In response to the members’ opinions at the focus group meeting, a closed LFS tenants’ area had also been set up, to allow discussion of housing association business. One of the original intentions of the Digcoop network had been to support the activities of the association by providing an additional communication channel and allowing for better distribution of

information: a common complaint of tenants was that they couldn't find out what decisions had been taken at meetings.

This latter function became one of the most successful aspects of the forum, with one of the key administrators posting housing association information and meeting minutes on the forum. This was an unexpected appropriation; while minutes might have been technically better placed using a document repository tool, posting within the forum as posts allowed for other members of the housing association to make replies to the minutes themselves.

As an informal chat space, the forum was not heavily used. Several conversations were started and resolved without too much debate, possibly reflecting both the small number of members within Digcoop and the smaller subset actively using the intranet. It was noticeable that the forum was used as a means of posting notices; while the News and Events tools also allowed this functionality, they were not used by the wider membership of Digcoop beyond the core members. The wider membership seemed to prefer the informality of posting their concerns or notices of events happening on the forum instead. Local issues such as litter were highlighted, though often with little debate, more resembling a broadcast by a single member to the wider community of their concerns.

It might be argued that this showed a purpose driven usage, as focus group participants had indicated. Subscribers had reservations about using online tools to communicate within the close neighbourhood and that they were only going to use such tools when they clearly offered additional affordances or benefits. Without the

network tools offering clear and distinct benefits, the existing channels of communication would continue to be used in preference. One local issue did arise shortly after the intranet went live, and this was probably the success story of the forum.

At the same time as the residents of London Fields Solutions had regenerated their own properties and formed the housing association in which Digcoop had grown, so the rest of Hackney was also experiencing a renaissance. Government funding had been spent on improving local services and the construction of a new arts centre and library nearby, and the housing boom in London had led to residential redevelopment in the area. Shortly after the intranet went live, members of the housing association became aware of a plan for a multi-storey residential development immediately facing one of the community's streets, including a 20 storey tower block, which would overshadow the whole of the area, as well as causing months of disruption during the building process.

Home

LFS Talk

Contacts

News

Info

Traffic graphs

EVENTS CALENDAR

February 2006

M	T	W	T	F	S	S
30	31	1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	1	2	3	4	5

This month

LOGIN FORM

Hi, Mark Gaved

Logout

Search

No Latest Events

search forum

LFS Talk

home
 profile
 reply
 thread
 help

Forum List ▸ Digcoop Talk ▸ General

newtopic

<< Start < Prev 1 2 3 4 Next > End >>

Re:Tower Blocks - 2005/12/15 14:12

josh

Synopsis of consultation responses – Hackney Central Issues and Options

Urban Design

Concerned about the heights outlined in the Urban Quarter option – most concern centred around London Fields DEA, Pembury Estate and Homerton High St (albeit to a much lesser degree)

Strong support for protecting Hackney's historic assets, but not the proliferation of 'fake' traditional designs

All new development must be high quality and integrate with existing urban form – need to provide clear policies to ensure this, not just vague statements

Generally admittance that the Hackney Core Precinct could support some higher development but should respect existing heights at the property boundary (circa 6 stories with tall development set back. Should try to comprehensively develop larger sites (or combination of smaller sites) rather than piecemeal development on individual blocks

Should not pursue a Croydon / Swindon style redevelopment – need to respect Hackney's character

Support for higher density around transport nodes

Roof gardens and micro parks supported

Certain developments regularly mentioned as being poor quality and an example of over development

Not all development should be built up to property line – development set back that provide public green space suitable for some areas

Design out crime principles are paramount

Public open space should be incorporated as part of new larger developments

Tall buildings need to respect local and strategic views – especially to and from London Fields

Sustainable design and use/reuse of recyclable materials

Sense of Place

Support for permeable cycle/walk routes but concerned about safety, crime and maintenance

Support for improving the public realm including cycling and walking paths

Improving the existing squares, links and public areas should be a priority

4 Firefox

papers

papers

My Documents

data_availabl...

EndNote

Figure 6-1: Use of forum in the tower block debate (member posting up report from council planning meeting)

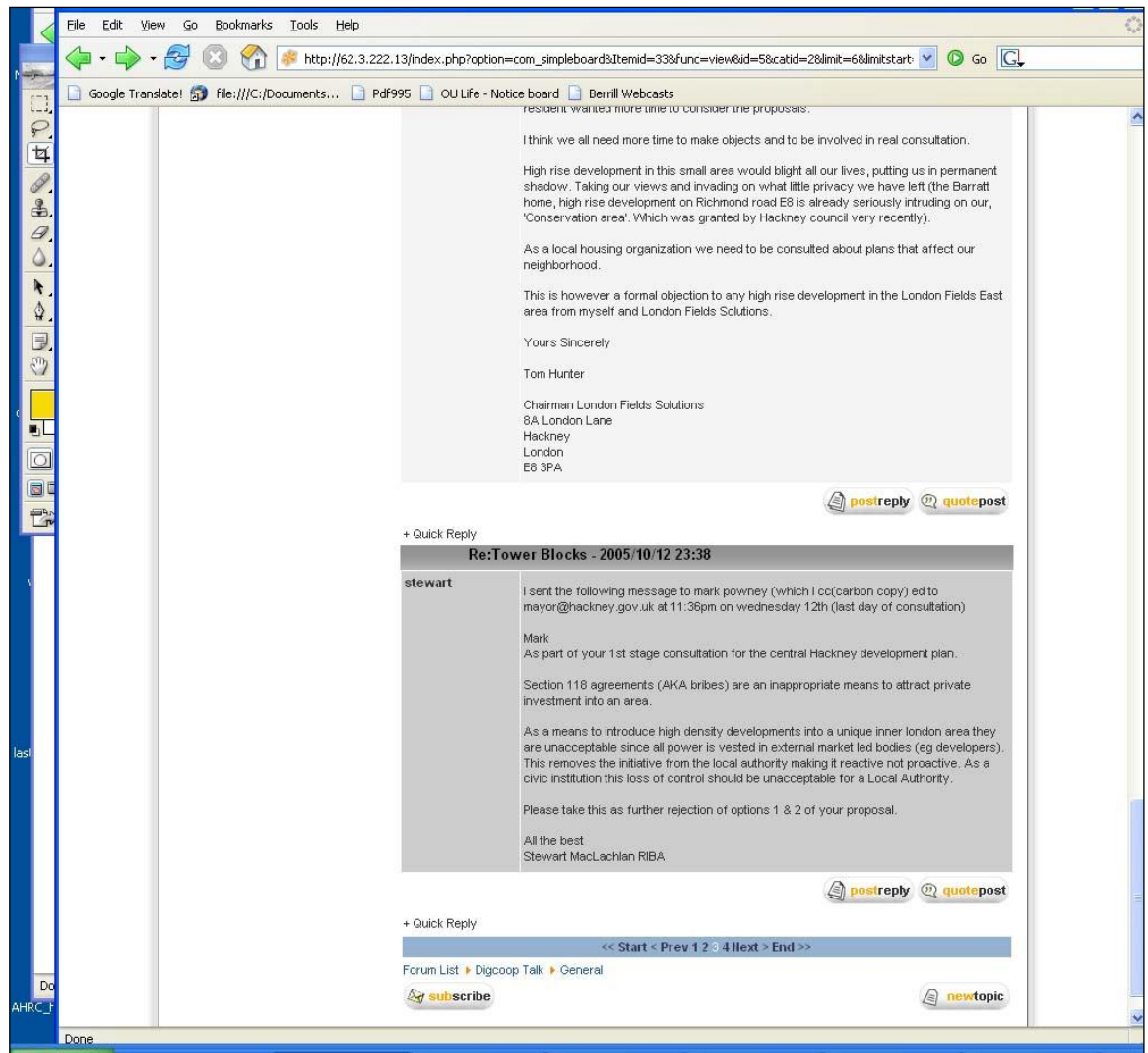


Figure 6-2: Use of forum in the tower block debate (member posting up copy of letter sent to local authorities)

Some residents of the housing association were unhappy about the building of the complex, and sought to draw together the broader membership to present a group response to the local council planners. The intranet forum became the focus for this process. It was used as a means of gathering consensus, and informing the LFS membership of the progress of the development. Active members within the community posted the dates of council planning meetings, and then reported on the meetings in postings on the forum. Individuals started a letter writing campaign to

the council, and posted copies of their letters onto the forum. A petition was started within the housing association, taken round door to door, and promoted via the forum, with posts encouraging members to sign up. At this point, the forum became a focal point for the neighbourhood as it offered a means for the community to share and debate the letters that they'd posted and encourage similar communications.

Generally though, the forum was only used occasionally for posting notices and at no other point during the research fieldwork period did the broader membership use it so actively. This may have been a reflection of the size of the user community, the existing satisfactory means of communication, a failure on the part of lead members to encourage usage, or a rejection by the community itself of the tools. Similar resistance to community ICT tools has been noted by Arnold, Gibbs and Wright in a planned housing estate in Australia (Arnold, Gibbs et al. 2003), and it maybe that these issues had been the reason for limited take up amongst the Digcoop subscribers. This will be discussed in Chapter 7, following, and analysed in further detail.

6.5 *Mehetnet*

The second group I worked with was Mehetnet, also in Hackney, introduced to me by one of the lead members of Digcoop. Approximately the same size and scope as Digcoop, though a newer initiative, this offered me the possibility of comparing two similar and geographically near groups.

6.5.1 Introduction

I became aware of Mehetnet through one of the lead members of Digcoop, Dave, who had helped to set up this initiative. In 2003 Dave had met a nearby Hackney resident, who was interested in networking up their local neighbourhood in a similar manner to Digcoop. Dave had explained how Digcoop had been set up and a collaboration between the two had started. Dave was introduced to members of the local residents' association, the Churchwell Residents Association, and a core group had begun to work with Dave to network their neighbourhood. When I met the initiative, Dave was leading the technical development, supported by one of the residents, Anna, a web designer. A formal organisation had been formed, named Mehetnet after the street in which most of the initial membership group lived (Mehetabel Road). Anna and Dave's original contact were leading members of the group, an accountant who lived in the street and managed the books for the organisation, and a small number of active members who helped with technical issues. Mehetnet had a more formal and business-like structure than Digcoop, with a clearer definition of roles and responsibilities.

Mehetnet covers two streets in Hackney, approximately 15 minutes walk away from the Digcoop community network. Most of the subscribers are homeowners and long term residents; a mixture of young professionals, families, and more mature residents. There is a close relationship between the existing residents' association and the newly formed community networking initiative, with a number of residents highly active in both organisations. Membership of the two groups overlaps and forms a close but not perfect match. With participants in close proximity but not all

direct neighbours, Dave and the lead members had set up a mainly wireless network radiating from a central connection to the wider internet at one of the lead members' houses. A roof mounted antenna provided a connection to houses in direct line of sight. Properties not in direct line of sight of this antenna were connected by linking to those properties that were, and in some case two or even three 'hops' (connecting via intermediary houses) were required. This avoided Ethernet cables having to be run across non-participating properties, though it placed greater reliance on a more complex wireless network model.

When I was introduced to Mehetnet, 12 houses had been connected, with further residents registering to join. The network was still being developed with Dave working to achieve satisfactory connectivity to all subscribers' properties. I had been informed that the network was relatively mature, and that the membership was keen to explore further possibilities. With a strong sense of community and a desire for greater interaction, already supported by the residents' association newsletter, the networking group was interested in investigating what might be possible beyond simple shared connectivity.

Mehetnet appeared to be an attractive partner for my research as the neighbourhood was near to Digcoop, which would allow for joint visits to both locations, and also provide similar environments for comparison. While the demographic of the residents was different (middle classed home owners compared to lower income housing association tenants) both groups represented active communities with existing social ties, living in urban metropolitan areas. One significant difference that I was not aware of and would come into play as the work progressed was the

differing state of the two networks. While Digcoop was a reasonably settled and mature, the Mehetnet network infrastructure was revealed to be still very much under development and experiencing difficulties in achieving a stable service. This struggle very much overshadowed the intended research as the fieldwork research period progressed.

6.5.2 Process

Dave introduced me to Mehetnet in early 2004 as a possible second networked community that I might study in comparison to Digcoop. I had previously explained to Dave that I was looking for a second group to work with, and he felt Mehetnet might be open to approach and had enough similarities to bear comparison. Dave approached Mehetnet with the suggestion that we might work together, and receiving positive feedback, he took me along on one of the next technical development visits he made to the group. This gave me the opportunity to meet the lead members and some of the wider membership in an informal manner, and also help out with the ongoing networking of the community.

Following the participatory research approach, I felt it was important that I should contribute to the technical work as well as undertaking my research, because this would be seen to be offering a fair exchange for my time and the potential disruption I might cause. My experience with Digcoop had taught me that some of the most valuable insights into how the community networks were managed could be gained by working alongside community members in the day-to-day mundane tasks that needed to be achieved. Often general conversations in these circumstances revealed a

far greater insight into the workings of the group than would be revealed in brief and more formal situations.

In the first two technical support visits that I carried out together with Dave, he introduced me to the lead members of the project. Rayah, who had formulated the original idea to create the network Dave had originally made contact with, Anna, who had taken on the lead of the actual development of the network, and Peter, an active member of the local residents' association, professionally an accountant and the treasurer for the initiative. The lead members were also active in the local residents' association, and there was a close correlation between active members of each group. I explained my research proposal; to work collaboratively with the group to set up intranet services within their community network, and to help train members in its use and to monitor its usage. I offered the following proposal:

- To provide a loaned computer from the Open University to host the chosen intranet set of tools and services, placed inside the Mehetnet network
- To help research possible tools and services
- To help facilitate focus groups and meetings to identify and agree on community priorities for services
- To help set up and manage the chosen system, working alongside the Mehetnet lead members

I would need:

- Lead members of Mehetnet to commit to supporting this process through their participation
- One of the members to take the lead in running the system, becoming the local expert, to ensure the ongoing sustainability of the system when my research period had finished and I could not commit to continued regular support
- Lead members to champion the services to the broader community with whom they had day to day contact
- A secure location for the server in one of the lead member's houses (unlike Digcoop, there was no office facility for the equipment).

This proposal was well received, and Anna indicated that she'd like to take on the lead coordinating and development role. Anna was employed by GreenNet, the UK computer networking non-profit organisation, so was experienced already in developing web-based services. We therefore moved to discuss the best way of undertaking the collaboration.

Mehetnet was still under development and the lead members were keen that a reliable network infrastructure should first be ensured. They agreed to be interviewed in the same manner as the other networked communities I had approached (see Chapter 4) and it became clear in this interview that the network was far from stable and a good deal of work was still required. Coincidentally, Dave had been recently offered full time work and was having to scale down his commitment to Mehetnet. This had left the lead members in a critical situation as they were still largely relying

on his expertise to manage the network infrastructure. I therefore found myself in a more complex position than first assumed, and it became clear that I would have to help improve the network before I could move on with the proposed intranet implementation.

6.5.3 Initial development

My priority was to work with the lead members to get a better idea of the network and document its structure, and train them in running the network. Overall, this was a useful process, as it forced the lead members to get more involved in running the infrastructure. The broader membership was in two groups; some members were keen to be further involved in the management of the initiative, and learn more technical skills, while others saw Mehetnet more as a utility and preferred to pay for its management by others, and were happy to pay for external support.

It had become apparent that considerable reconfiguration of the network would be required to bring about its stability. As I was based in Milton Keynes and only able to visit occasionally, this at first appeared to be a major stumbling block. However Mehetnet had some finances available, and San, a community networker from Boundless (a group that had grown out of Consume), was willing to help work on improving the network. The next few months were therefore spent documenting the current infrastructure and San taking the lead in rebuilding the network, working alongside Anna. This was a major delay for me, but meant I got a better understanding of Mehetnet and Anna became much more involved in understanding how the network ran. I helped out on occasion and this meant I got to meet a lot more

of the members informally and gradually became known by the wider community. During these visits, I again raised the idea of moving forward with a study of social software, and Anna set up a meeting at her house (Autumn 2005) to discuss community goals with the membership.

6.5.4 Focus groups

Focus groups were used in order to understand the community's goals and purposes, and to elicit ideas from a larger number of members than would have been possible in individual interviews. Two of these were held to specifically talk about intranet tools and services, and I also gathered opinions and community input from participation at a Mehetnet meeting, and a Churchwell Residents' Association meeting. I used these first of all to gather initial ideas, then to report on developments, and finally to agree on which specific services and how to deploy them. At the same time, I was visiting Mehetnet informally to help Anna work on the network infrastructure and conversations with members at these times informed the larger meetings.

First meeting: Mehetnet meeting

The first meeting I attended to broach the idea of developing tools and services was at a Mehetnet administrative meeting, that Anna had invited me along to in order to introduce me to the group, and present the general idea of a collaborative deployment of social software within the network. This was held in Anna's house, which was often used for Mehetnet meetings so familiar territory for the attending members (8

people). The meeting was mainly focussed around Mehetnet business (subscriptions, state of the network, technical cover etc), and I was given a chance at the end to make my proposal. This was received well, and the members offered some initial suggestions for what tools could be deployed, including a mailing list, music server, “blogs for the kids”, CCTV, and a discussion board. However, while some of the members were very familiar with social software, this was a new concept to some. It was agreed the first action would be for me to draw up a list of tools that were being used in other similar communities, and examples of other grassroots initiatives, to offer the membership a clearer idea of possibilities. Anna was able to set up a mailing list through her workplace, and she enabled this tool for the community shortly afterwards. I stressed that the focus should be on what community purposes the tools should support, and we agreed to arrange a second meeting for the wider membership specifically focussed on the intranet idea.

Second meeting: Intranet focus group

This meeting, promoted to the broader membership, was again held in Anna’s house. I was introduced to the 8 attendees, and presented with Anna our proposals and goals. A flipchart was used to document the meeting as we progressed, with one member chosen to be scribe to write down ideas and suggestions. I had decided not to record the meeting using an audio recorder as I felt that this might restrict debate and instead wrote up notes after the event, and passed a copy of these back to the group later for approval.

Participants were happy to talk, and many ideas were offered. Approximately half the members had significant IT experience through work, and several had used social software of some description in home or workplace environments. For several members, social software was a new concept but framing these as ‘community tools using IT’ allowed all to engage in the general debate of how they wished to capture community knowledge and share resources. I showed examples of social software used by other groups, handing round print-outs of screen shots to help seed some ideas, though I tried to steer away from specific technical details and focus on their general functionality. Managing the discussion to be inclusive of all participants was at times difficult as there was great interest in the technological details of tools as well as an interest to define what the community’s information sharing needs and purposes might be. The following ideas were suggested in the meeting:

- Who can feed my cat?
- Local eBay
- Collective responses to council e.g. planning
- Personal space on network – virtual briefcase
- Mailing list
- Noticeboard /bulletin board
- Photogallery
- Local history
- Sutton House (a local National Trust owned heritage property)
- Local school information
- Marian Court Tenants Association (a neighbouring social housing block’s tenant’s group)

- Minutes of Mehetnet and Churchwell Resident's Association meetings
- Technical support
- Network level virus protection
- User FAQs for Mehetnet usage
- Links to local businesses
- Groups
- Events
- LETS (Local Exchange Trading System), e.g. Picking up kids
- Kids section

It was agreed that I should work with Anna to consider a short list of possible tools we could test and to address people's questions and concerns. We would consider the best way of getting pilot services running for members to then look at, and that I should come back to a later residents' meeting and present with Anna what we felt would be the most feasible tools and services to put into operation in the first place.

Third Meeting: Churchwell Residents Association

Setting up a third meeting proved harder than expected, with the realities of community engagement coming to the fore. Several dates for meetings were cancelled due to Mehetnet members' other commitments. Eventually it was arranged that I would be able to attend a meeting of the Mehetabel Road Residents' Association and present a progress report as an item on the agenda, and get feedback and input from the membership.

This third meeting took place in another member's house and there was a mix of the people from the previous meetings and some people I'd not yet met: approximately 9 in total. Various items of the Residents' Association business were discussed, such as rubbish outside a local takeaway, and the planning of developments by the playground at the end of the road, and I was introduced to the membership to talk about Mehetnet and possible future software services we might build together. As with the previous meeting, the participants had a wide range of technical expertise so we spent a little time describing what services might be supported and what they could do, summarising discussions that we'd had in the first two meetings.

An important discussion centred around who might be able to access the services, arising from the not entirely perfect match between membership of Mehetnet, and membership of the Residents' Association. The Resident's Association defined itself as covering the two streets (Mehetabel Road and Isabella Road) while Mehetnet as a wireless network was defined by where the radio signals could reach. Indeed, just previously to the meeting we had connected a prior resident of these streets now living around the corner and within wireless range of the network, in Sutton Place. The Residents' Association was clear in its brief to represent the residents of the two streets, while Mehetnet represented a local community resource that might extend further than the two streets. This inexact match had not mattered while Mehetnet was just providing shared internet access, but the potential addition of private intranet services raised questions.

Participants at the meeting were keen to see community outreach, bringing more people into their shared geographical community, for example engaging the residents of a council owned residential block (Marian Court) at the end of a nearby street overlooking Mehetabel Road. Some services requested by people present at the meeting would benefit from a broader input, such as gathering local stories and providing news about local events. However, other proposed content had to be kept private to Churchwell Residents' Association members, such as financial information. Placing a possible intranet server within the Mehetnet network would offer Mehetnet members the advantage of a fast local connection, and additional security for the information held on the server, but it might mean that some residents on other internet connections might not be able to access Residents' Association information, making it much less useful.

There was general agreement that the members wanted to move forward with setting up some trial services, and it was agreed that I should set up a server and carry out some initial configuration of basic software tools. We had agreed I would set it up as a linux server with open source software as this meant there was no cost or licencing issues, and Anna, who would take over the running of the system, was familiar with this software.

Fourth Meeting: Intranet focus group and technical meeting

The fourth meeting was with a core group of Mehetnet members (4 in total), and we discussed how to bring the first services online. San, a wireless networking expert

from Boundless was also present, as he was now helping to maintain Mehetnet's infrastructure.

In the meantime I had arranged for a donated computer from the Open University which could be set up as an intranet server. Unlike Digcoop, Mehetnet did not have a dedicated office space so it would be housed in Anna's property. We decided to initially set it up for configuration in the Digcoop office, so it could be looked after by the Digcoop team, and transferred across when ready. We agreed that I would work with Anna and teach her how to access and run the machine, and then gradually hand over control until she was comfortable running it herself. Anna asked if we could use the content management system Drupal as the base software, as she was familiar with this from work. This had the advantage of a large user base with many freely available modules that could be used to support the functions the community had asked for.

6.5.5 Development and implementation

Shortly after this meeting, I brought the computer to London and set it up in the Digcoop office with a new temporary Digcoop address. Having installed the basic Drupal content management system on the machine, I reconfigured the Digcoop network to enable external access from the internet to the server, and taught the Digcoop administrator how to access the machine in case it needed to be restarted or shutdown. I tested that I could gain access from my home and the Open University, and then emailed Anna as the server was now ready for her or other Mehetnet members to configure and run.

6.5.6 Delays and no further development

I invited Anna to test the system but she was away travelling on work at the time. When she got back she had a backlog of work, and was unable to work on configuring the system. I found myself in a dilemma; the system was ready to go, but Anna was unable to find the time to use what had been set up. The delay extended for several months and I came to the end of the research period I had allocated for working alongside the community groups. I contacted Anna at various times via email and phone and on each occasion she was keen to note her enthusiasm for continuing to progress the configuration and setting up of the machine, but her work and other commitments held her back from undertaking any development.

Eventually I reached the point where I had to finish my fieldwork commitment and move to writing up the thesis. I left the machine operational and open to access so Anna could continue development, and informed Anna that I had to move to the next stage of the research, but she was welcome to continue with the configuration and deployment, and I would be able to help informally to a lesser degree. However, Anna did not proceed further, so the machine was never used and no software was ever tested by the community group.

6.5.7 Future plans

While the server was not used past this point, Mehetnet continued, and the mailing list set up by Anna continues to be used by members. Anna was busy for the next few months, so we lost inertia and she focussed her limited time in the next year on improving the network infrastructure. This still continued to require considerable energy to maintain, though eventually it was strengthened and became stable. More recently, Mehetnet have used spare finances to overhaul this infrastructure and pay for a new set of wireless equipment, professionally installed, but maintained by the community.

6.6 Summary

At the end of the research fieldwork period, less progress had been made than anticipated. In Digcoop, we had deployed the intranet tools and services, but only limited usage had been made, with a few notable exceptions. Unexpectedly, it had

been the simpler, more basic tools that had been taken up by the members of the initiative, and despite requests for a range of more complex tools, these had not been assimilated into daily practice. The one occasion when the community had employed the intranet, to share resources in their fight against the planned tower block development, had hinted on future usage but this was not witnessed during the research fieldwork period. Table 6-1, following, summarises expected and actual progress in deployment of social software tools in Digcoop.

In Mehetnet, a longer period of consultation and shared planning had taken place, but the intranet itself was not deployed during the fieldwork period (for this reason, there is no corresponding table similar to Table 6-1, describing expected and actual progress in deployment). Despite enthusiasm by members and an active usage of the mailing list that had been set up at the time, which hinted at a readiness to explore social software, delays had meant we ran out of time. This revealed that there are barriers to the uptake of social software in grassroots initiated networked communities as well as externally initiated projects. In the next chapter I will attempt to analyse these barriers and identify which factors may have had the greatest significance.

Tool	Expected usage	Actual usage
Network status 'traffic lights'	Offering autonomy to members to self-diagnose problems with network. Regular (weekly) usage expected	As first point of network diagnosis by members, regularly, and well received by community.
LFS Talk (forum)	To extend communication between face to face conversations, multiple postings expected daily, with varying amount of use between members	As a documentation and broadcast tool to keep community abreast of local issues. Small number of posters, wider number of readers.
Events	To enable members to post notification of local events, used on a regular (weekly) basis	Used as planned by lead members of the networking initiative and a low number of active readers. Initially active on a weekly basis, declining to no usage: little used
Contacts	Point of contact for rapid connection to initiative lead members and housing association, to be used as required (expected to be weekly)	Little used, with members acquiring this information through other means (mainly via phone, text and face to face)
News Stories	Posting of local news story on regular (weekly) basis.	Initial regular postings by initiative lead members dwindling to few postings. Few readers.
Info: local information	Central resource for local information to be updated regularly and used as and when required (daily/weekly)	Little used by members: information sourced online and offline from elsewhere
Traffic graphs	Offering autonomy to understand times of peak network usage and modify behaviour accordingly, to be used daily	Enabled members to modify usage patterns to optimise access, used regularly and much liked
Small ads	Local Freecycle and trading tool, 5-10 posts / week expected	Initial explorations by small number of members but not taken up by the community

Table 6-1: Summary of expected vs. actual social software tool use in Digcoop

7 An analysis of the barriers to social software adoption

7.1 Introduction

In this chapter I analyse the findings from Chapter 6, which explored the development and uptake of social software in the two networked communities, Digcoop and Mehetnet. Despite an involved fieldwork collaboration with the two initiatives, take up of social software was less than expected. I consider the barriers and analyse which were most significant in each case.

7.2 Overview of field research

Over the period of 18 months I worked alongside two grassroots initiated networking communities in London, Digcoop and Mehetnet. I maintained a high level of contact, visiting each site and meeting with organisers most weeks and communicating in the intervening periods via email and telephone. My intention was to support each group in their development of social software tools and services to run on their networks, and watch how these were used by the members in each community. I worked alongside the groups, helping provide expertise in practical problem solving, providing support where requested, and facilitating the implementation of the network infrastructure and social software services. The goal of this collaboration was to understand factors that might lead to the successful adoption of social software tools within the communities . Analysis of the process of adoption would

enable me to develop a framework for undertaking research working alongside community practitioners developing grassroots initiated networked communities and to draw lessons that might be applied in future networking initiatives and inform decision making at policy level.

However, despite forming good relationships with a range of participants in each community, and positive and enthusiastic planning meetings at each group, the agreed plans to develop software tools and track how well they were taken up did not proceed as far as I had hoped in either location. The focus of this chapter therefore has shifted; rather than simply an analysis of how software adoption and usage occurred, it has evolved into an analysis of what development did take place and consideration for why adoption was only partial in Digcoop's case and did not commence in Mehetnet's case. This still enables us to explore the success factors as seen, reflect on possible frameworks for undertaking research alongside community practitioners, and draw lessons that might be applied in future networking initiatives and inform decision making at policy level. A new question has been thrown up though – why did the two initiatives not develop as far as I had hoped?

In Digcoop, software was put in place (see Chapter 6, Section 6.4.3 'Initial Development') and made available to all members in the community, but little used. In Mehetnet, an intranet was never put into live operation during the research period. This period was occupied in trying to bring the network infrastructure to a satisfactory level, and while there were discussions and initial planning around the services that might be supported in an intranet, these were not activated. In this

chapter I will attempt to analyse why there was less progress than I had expected to see and draw some tentative conclusions.

There may be several reasons which meant that software was not taken up as expected, and each of these or a combination may explain why the goal of a participatory development of a functioning and well used intranet did not succeed in this timeframe. It is interesting to note that since this time, members of at least Digcoop have embraced the emerging social networking tools and both groups have continued to commit to the ongoing development of their initiatives' network infrastructure. What, therefore, could explain the reluctance to take up the social software tools that seemed to be received with enthusiasm during initial meetings with a number of members from each group? Below, I will seek to identify some of the main reasons.

Drawing from research explored in the literature review (Chapter 2) I will try and interpret why community members did not take up social software as I had expected. Specifically, I will draw on three pieces of research: Arnold, Gibbs and Wright's work looking at the Williams Bay community intranet (Arnold, Gibbs et al. 2003), Damsgaard and Scheepers' exploration of organisational intranets (Damsgaard and Scheepers 2000), and Gaver's reflection on the failure of the domestic adoption of technical systems (Gaver, Bowers et al. 2009).

7.3 Lenses for considering effectiveness of intranets

To analyse why the intranets in Digcoop and Mehetnet failed to progress as far as I had hoped within the research timeframe, I will examine what did happen using frameworks devised by researchers considering the progress of similar systems elsewhere. Viewing the Mehetnet and Digcoop intranets through these lenses may enable more detailed reflections on why the results were not as expected.

The first model I will draw on is Arnold, Gibbs and Wright's exploration of the Williams Bay community intranet in Australia (Arnold, Gibbs et al. 2003). Williams Bay was anticipated to develop a thriving intranet yet in the first year after the launch, there was "negligible site activity" (Arnold, Gibbs et al. 2003, p.2). Arnold and his colleagues proposed five possibilities for why usage was low:

- The aggregation of potential users and content was not appropriate;
- The technology was not appropriate;
- The conception of community relations on which the intranet was premised was not appropriate;
- The residents' perception of efforts to engineer community relations was not appropriate;
- The identity of the intranet as a domestic artefact was not recognised by the residents

The first possibility identified is the need for critical mass: if not enough people use the service, then it has less value as a shared community resource and not the

appropriate place to share community knowledge. There is little value in advertising a community event on an intranet site if nobody will read a notice placed here.

Conversely, if a site has many readers but nobody posts any content, it will die off from lack of valuable content.

The second possibility for low usage is that the technology was not appropriate; that there were better ways to communicate. As Arnold's paper is entitled: "An intranet is all very well, but do we still get free beer and a barbeque?" (Arnold, Gibbs et al. 2003, p.1): sometimes the best way to communicate with your neighbours is in a face-to-face social setting, rather than via an intranet forum.

The third possibility is that the supposition of the nature of community relations was incorrect; people may not wish to choose to talk to their immediate neighbours but consider their community to be less place-based and not so rooted in Tönnies' *Gemeinschaft*. A community intranet that focuses on connecting together people living in the same area might not be as useful as hoped.

The fourth possibility for understanding why the Williams Bay network had little take up is that it was seen as an intervention into local people's lives; that an external body sought to engineer community relations through the implementation of the intranet and that the local community resisted this intervention.

Finally, Arnold and his colleagues suggest that the intranet was not seen as relevant to people's lives; that it was an alien artefact and while it was familiar to the developers it was still seen as 'wild' and an unknown quantity to the residents. New

technology needs to be ‘domesticated’; people need to explore its possibilities and find out if it is something that can benefit their social practices, before accepting it into their routines and possibly changing these routines to incorporate the new systems. This process of domestication requires “mutual reciprocity” with the participation of the developers supporting the users and modifying the system to better fit into their practices.

Parallels can be drawn between my studies of grassroots initiated networked communities and Arnold et al.’s studies of the Williams Bay intranet due to the similar goals and context of each research. As such it is likely that exploring my studies through the Williams Bay analyses may provide useful lessons.

The second model I shall use to reflect on the progress made by the community groups in setting up and running their intranets is that devised by Damsgaard and Scheepers in their exploration of organisational intranets (Damsgaard and Scheepers 2000, p. 137). Damsgaard and Scheepers examine how the implementation of an intranet may confront different potential points of failure on its path through development, identifying “three existential crises” that may occur:

- Sufficient resources and the need for a sponsor
- Achieving critical mass of users and content
- Maintenance of order within the system and management of resources

The first crisis is that of resources, and the need for a sponsor. If the necessary resources are not available to run the intranet, and a sponsor within the organisation

does not support its development, the intranet will fail. The second crisis is the need to achieve a critical mass of content and users; if not enough people use the intranet, and not enough content is created to make the intranet worth visiting, then it will fail. The third potential crisis that can destroy an intranet is the need to maintain order and manage the resource. If the intranet “grows wild” without management of the content so it is not up-to-date and relevant, users will distrust it as a resource and find other ways “to obtain timely and accurate data” (p.138). While Damsgaard and Scheepers reflect on the development cycle of commercial organisations’ intranets, we can apply their analysis to the community initiated networks being studied in this thesis. In many ways, the community groups and their leaders can be considered to be sharing similar goals to the corporations Damsgaard and Scheepers have studied, wanting to share information amongst their members and encourage interaction.

The third lens I will use is Gaver, Bowers, Kerridge, Boucher and Jarvis’s work exploring how an introduction of a novel sensor system into domestic environments failed to be taken up and used by participants (Gaver, Bowers et al. 2009). The system included both hardware and software, and as such I see an analogy between this and the communities I was studying, where the system includes both hardware (the network) and software (the intranet). Gaver et al. framed their examination of why a system may or may not be successfully deployed by exploring four different themes:

- Engagement: how engaged the users were with the system
- Reference: users framing of the technology by referring to analogous systems

- Accommodation: how much the users changed their behaviour or practice to incorporate the new system
- Surprise and insight: how the new system benefitted and improved their current practice

The first theme explores how engaged the users became with the system; a successful system can be identified by the “persistence in use and interpretation over time” by the testers (p.2219). As it is explored, users might develop and reinterpret how it is adopted. Gaver noted by comparison that the unsuccessful system introduced into the home of some testers was little talked about and they seemed willing to continue with a field trial indefinitely “because the system was not disruptive rather than because it was a valued addition to their home” (p.2219).

The second theme identified by the team was that of reference: “the tendency for volunteers to discuss successful prototypes through references to other technologies or experiences that they like” (p.2219). Successful technologies or systems might be referred to as approximating other systems that are part of the users’ social practices, allowing “its appeal to be understood and articulated”. For example an intranet system might be articulated as being a bit like a telephone, a community noticeboard, or similar or not to chatting over the garden fence. By their choice of other systems to compare the newly introduced technology to, Gaver’s team felt this would help understand how the users felt about the new system. For example one prototype was only referred to in terms of surveillance, and potential invasions of privacy, and only made limited references to other systems overall. This can be seen as similar to

Arnold et al.'s identification of the appropriateness or otherwise of a technology to a social situation.

The third theme is that of accommodation, studying to what degree the participants “accommodate successful designs to their existing domestic activities and rhythms” (p.2219). Similar to Arnold et al.'s consideration of domestication, Gaver's team explored whether the new system or technology was taken into the household's social practices, if a place was found for it in their existing practice or if indeed they modified their practices to make space for the new system. Gaver's team note that the “domestication of a new prototype appears to be a prerequisite to, and evidence for, its success” (p.2219).

The fourth theme identified by Gaver's team is that of surprise and insight, declaring that “successful systems are those which continue to occasion new surprises and new insights over the course of encounters with them” (pp.2219-2220). Not only is a successful system one that users persist with over time, but it is also something that reveals new aspects as users continue to engage with it, and offers unexpected benefits or uses. This may be the revealing of a functionality that users were not previously aware of allowing them to do more than they expected, or simply that continued engagement with a number of other community members mediated by the system opens up possibilities that had not originally been thought of or planned for.

Gaver et al.'s work is very much of interest to this research because his team considers the domestication aspect of a socio-technical system. There is a close parallel with how Gaver's team explores how an externally designed system is

received by 'end users' and how the users consider whether or not and how it fits into to their daily lives and social practices.

Examining each of these three approaches we can synthesise key points and generate a list of eight hypotheses, which may be used to test why the Digcoop and Mehetnet community intranets did not progress as far as expected (see Table 7-1, following).

Arnold	Damsgaard and Scheepers	Gaver et al.	<i>aggregated as</i>
Aggregation of users and content	Critical mass of content and users		Critical mass
Technology not appropriate		Reference	Unsuitable application
Privileging of local community relations			Local vs. ego based interactions
Resistance to social engineering			Local resistance
Domestication		Accommodation, Engagement	Domestication
	Need for sponsor and resources		Sponsorship
	Management of ongoing system		Upkeep
		Surprise and insight	Surprise

Table 7-1: Aggregating the three approaches to eight hypotheses

We will now explore each of these hypotheses and consider how strongly they reflect the situations experienced in Digcoop and Mehetnet.

7.4 Hypothesis 1: Critical mass

The first hypothesis to explore is how much the issue of critical mass affected the progress of the Digcoop and Mehetnet community intranets. The papers I have used as reference consider the need for intranets to have a sufficient number of users and enough content to flourish. A third aspect that I will consider is critical mass in terms of numbers of lead members, as it may be argued that the limited number of individuals driving the development of the intranets also affected the development of the intranets.

Some forms of activity on an intranet forum will be more dependent than others for feedback to achieve a critical mass and a vibrant community; for example a single member may be happy to post messages about what is happening in the community with little feedback and may continue to do so over a long period of time if they are motivated, whereas a discussion between members on a forum is unlikely to flourish if there are few people posting few comments. Damsgaard and Scheepers (Damsgaard and Scheepers 1999) have formulated a categorization of types of intranet technology use modes and these can be considered while exploring intranet usage and critical mass (see Table 7-2, following). Some forms of communication require more feedback from the community and a larger number of participants to succeed than others.

Use Mode	Description
Publishing	Using the technology to publish information (e.g. home pages, newsletters, technical documents, product catalogues, employee directories)
Transacting	Using the technology to transact with functionality on intranet pages and other organizational computer-based information systems e.g. via web forms
Interacting	Using the technology to interact with other individuals and groups in the organization (e.g. via discussion groups, collaborative applications)
Searching	Using the technology to search for organizational information (e.g. via search engines, indexes, search agents)
Recording	Using the technology to record the computer-based 'organizational memory' (e.g. best practices, business processes, frequently asked questions)

Table 7-2: A summary of intranet technology use modes (Damsgaard and Scheepers 1999)

The communities served by the Digcoop and Mehetnet community intranets were in both cases smaller than that of Williams Bay. In Digcoop, approximately 60 residents translated into a subscriber community of over 40 network users at the commencement of the research period. In Mehetnet, two streets of houses, approximately 100 residents, translated into a subscriber community of approximately 30 network users at the commencement of the research period. As well as these paying subscribers I was aware that family, friends, and visitors also

used the networks in each location increasing the number of potential intranet users. In both cases, the primary audience was to be paying subscribers and residents in the two communities. The introduction of the intranets was hoped to encourage the participation of additional residents from within the respective neighbourhoods but I and the collaborating community initiators expected that these subscribers would represent the intranet community in the first few months of operation.

Digcoop's intranet was developed as a result of the focus group meetings by one of the lead members with some support by me. I provided the computer and configured it on the network, but the software set up and customization was carried out locally working to the requests made by the community members. The intranet services (see Chapter 6, Section 6.4.3 for details) were then promoted to subscribers, who were encouraged to view and contribute to the intranet.

Usage of the services could be divided into two groups of participants: lead members, and the wider community. The types of usage fell into three kinds: **technical**, using the intranet to support the subscribers' use of the community network; **community**, using the intranet to support community interactions; and **business**, using the intranet for housing association business. These kinds of usage draw from the types of services provided (see Chapter 6, Section 6.4.5), but in some cases appropriation of services for unexpected purposes occurred.

Having set up the services, the lead members seeded them with content to encourage take up. The lead members used the intranet for posting notices on the forum (technical, community and business use) and for tracking usage of the network

infrastructure and the intranet. They posted messages about the community and the network (Damsgaard and Scheeper's 'publishing' and 'recording'), which did not require feedback to continue, so could be said to achieve critical mass if they were sufficiently motivated to continue independently. However, if no feedback was encountered, message threads might become dormant. This was witnessed, with an initial large volume of postings made by the lead members gradually reducing during the research period. I hypothesise that the lead members became less motivated to post when receiving little feedback.

Lead members used the intranet regularly to track usage of the network infrastructure itself, as file sharing by members leading to network slowdown or freezing was a regular challenge that needed to be managed. Lead members also used the intranet's logging tools to track other members' usage of the intranet. This 'transacting' use required no other user input, and the log data was content enough to keep the lead members revisiting the intranet pages. It could be said that critical mass was achieved for the lead members. They were highly motivated to promote the services and maintain quality of service of the network, and they continued to post on and view the intranet during the research period.

For the general membership, much less visible activity was witnessed. Only one member posted on the small ads site, and received no responses. Forum usage was limited, until as noted in Chapter 6 (Section 6.4.6) a passionate debate erupted over the possible building of a nearby residential tower block. For a period of several weeks the intranet became a vibrant site where half a dozen members posted on this topic and others. There was evidence of 'interacting' as well as 'publishing' with

members posting copies of the letters written to the local council, using the intranet as a means of recording activity, and resulting in debate. Briefly, the intranet forum achieved a critical mass of users and content, before traffic receded towards the end of the research period until no more content was being posted. Arnold et al.'s argument that a shortfall in traffic will lead to a failure in achieving critical mass appeared to be relevant here. We could hypothesise that this may be because of Arnold's argument that "if the boundaries [of the subscriber intranet community] are drawn too tightly, and the zone of inclusion is too small, critical mass will be deficient" (Arnold, Gibbs et al. 2003, p.5). One anticipated use that had been much talked about by members in planning meetings was the posting of housing association business, such as recording minutes from meetings and using the intranet as a forum for decision making. This did not materialise, to the surprise of the lead members, due to other barriers that will be discussed later.

As well as active participation, discussions with individual members indicated that non-visible 'lurking' occurred, with members visiting parts of the site but not actively adding to content. This would correspond with observations made by other authors who note that lurkers make up a significant part of traffic to websites. Curiosity was shown by members about what had been built following the focus group meetings, and after the lead members had promoted the services. One service that was well used was a tool that identified network status by 'traffic light' indicators on the home page of the intranet. As previously noted the network suffered periodically from slowdowns or freezes due to excess traffic, as well as physical issues such as cables being broken or wireless connections dropping. Members also managed their own technical infrastructure, for example whether their computer was

functioning correctly, software issues, network issues in their own property. The intranet became a recognised resource for finding out the status of services, with technical support calls to the lead members including reference to whether or not the intranet or wider internet could be seen, indicating whether the problem was between the person's own computer and the central server room in the housing association's office in one of the properties. This 'transacting' function appeared to be the most successful intranet service.

A critical mass of lead member resources is also required to achieve a functioning and vibrant intranet. While the intranet was implemented, the lead members were affected by the waning interest from one of their team. This reduced their capacity to work on the intranet as well as having their energies subsumed by the maintenance of the network infrastructure and management of users' access to the network (e.g. fixing computers, connecting new users). Furthermore, the interest of some of the lead members lay more in the networking infrastructure, so while there was sufficient critical mass to run the network itself, there were less resources available to encourage take up and regular usage of the intranet amongst the wider user community. Time and energy available to train the wider membership was also limited, and this affected take-up.

In Mehetnet, the intranet was not put into operation within the research period, so the discussion of critical mass can only be discussed in a different perspective. What is of possible relevance is whether or not a critical mass of enough members had been achieved to enable the launch of an intranet service. In Digcoop, there were between three and four lead members actively involved in the philosophical visioning and

technical creation of the network and intranet at any time. In Mehetnet, however, there was only a single lead member taking on technical responsibilities, Anna. Other members of the community were keen to see services developed, with 8 or more members attending all planning meetings. However, technical implementation was seen as the responsibility of Anna and myself, with other members unable to or choosing not to participate in this aspect of the work. As a result, Anna inadvertently took on the role of sole 'gatekeeper' (Tushman and Katz 1980), mediating between the community and me, with the development of the intranet being dependent on her availability and the time she could offer to the project. As a result of the focus groups, I set up a network server ready for Anna to configure to the wishes of Mehetnet, with access for her over the internet set up and passwords handed over. However with Anna's busy work and personal schedule, the time taken to organize the focus meetings moved further into the research period than expected, and she was unable to find the time to configure the intranet services. As a result, I arrived at the end of the research without the intranet being readied for live operation. It can be therefore argued then that the critical mass hypothesis also strongly applies in Mehetnet's case; that without sufficient lead member resources being available, a critical mass of resources is not available to create the intranet in the first place. With only a single initiator, there was no alternative route that could be taken: Anna was a gatekeeper for me and to bypass her and undertake technical development, or training of members, might have been socially divisive.

In summary, I would argue that the issue of critical mass played a significant effect in the limited take up of the intranets in Digcoop and Mehetnet.

7.5 Hypothesis 2: Unsuitable application of technology

The second hypothesis to explore is whether the intranets represented unsuitable applications of technology for the intended purpose. Arnold et al. suggest the limited uptake of community use of the intranet in Williams' Bay might have been due to an intranet being perceived as unsuitable for communicating between members of the locality (Arnold, Gibbs et al. 2003, p.7). Gaver et al. also consider the suitability of technology when introduced to the home. They identify that a successfully introduced technology would be contextualised by the new users in terms of how it was like similar technologies they had previously encountered, "constituting a category of valued experiences that could include the prototype and thus allow its appeal to be understood and articulated" (Gaver, Bowers et al. 2009, p.2219). We can reflect on how the residents of the two communities responded when the idea of an intranet was proposed and how they engaged with the idea during its introduction.

Both localities with which I engaged already had a strong existing sense of identity and high level of community interaction, where neighbours were well known to each other before the networks were set up. The locality in which Digcoop is based, the two streets of Ellingfort Road and London Lane, could be described as an elective community where neighbours had chosen to live in proximity to each other. The majority of the residents were either part of the organisation (London Fields Solutions) that had purchased the properties and converted the neighbourhood into a housing association or were friends who had been invited to join. All residents belonged to London Fields Solutions and were expected to attend meetings and

participate in the running of the organisation as a condition of their being tenants so a high level of formal and informal interactions already occurred.

Mehetnet was set up in a locality that would not be described as an elective community though it had a strong sense of local identity, with an active neighbourhood group, the Churchwell Road Association. Residents were a mixture of home owners and private renting tenants, with Mehetnet participants mostly home owners. As with the Digcoop community, there was already a high level of communication between neighbours, both more formally through the activities of the Churchwell Residents Association resolving local issues and considering future neighbourhood activities, and informal neighbourhood relationships.

In both neighbourhoods there was sufficient interest in the use of networking technologies for local residents to set up their own networked communities, and a number expressed a desire to work with me to develop intranets. Their decisions to independently build a local network, and to explore the development of additional services to leverage the infrastructure suggests that members of both neighbourhoods were comfortable with the idea of the new technologies becoming part of their communicative ecologies.

As noted in Chapter 6, residents suggested a wide range of ideas as to what the community intranet might offer. The concept of an intranet was considered as a way of extending current communication tools where there were perceived failings or that an intranet had potential additional affordances. However in practice there was less take up of intranet services than expected in Digcoop, and no activation of the

intranet in Mehetnet. Was the intranet as a technology an inappropriate means of communication for the communities? I would argue not, as there is evidence that similar services hosted externally to the local networks were well used and continue to be actively used by the residents.

In Digcoop, the emerging internet-based social software tools were widely adopted: many residents took up Facebook accounts, and were active users of music and video sharing tools. Applying Gaver's theory of the contextualisation of new technologies through reference to existing tools, residents in Digcoop suggested a local resource sharing noticeboard on the intranet (for unwanted possessions, or borrowing items) would be "like Freecycle" (Digcoop intranet focus group meeting, 2005). Members were already using Freecycle, however they felt a more localised intranet equivalent might improve upon what was currently available.

In Mehetnet, while the intranet did not enter operation during the research period, a mailing list hosted remotely and managed by the Mehetnet initiator, Anna, was actively used by residents. This was posted to by a number of local residents to discuss both network and intranet developments, and also local issues such as offering unwanted items, concern about local rubbish, and house sitting arrangements.

In summary, I do not think the hypothesis of the intranet as being an unsuitable application of technology for supporting local conversations was a major barrier in preventing its take-up in the two neighbourhoods. Residents were using other similar

services on the internet, and had proposed critical and pragmatic use scenarios for intranet tools during planning sessions.

7.6 Hypothesis 3: Local versus ego-based interactions

The third hypothesis is the concern that a social environment defined by locality is too tightly bounded a setting for a successful community intranet: “local community intranets which privilege and attempt to define, bound and ground relationships within a place-based geography are working on the wrong assumptions about social relations and are doomed to failure” (Arnold, Gibbs et al. 2003, p.12). Residents’ interactions and social groupings may be more “ego-based” (Arnold, Gibbs et al. 2003, p.11) than place-based and to restrict communications to only neighbours limits the value of the intranet services too greatly to make them worth using.

The neighbourhoods supported by Digcoop and Mehetnet are engaged in high levels of local social interaction: locality-based socialising is important for their residents. The Digcoop neighbourhood is an elective community, with residents bound both socially and also legally through the London Fields housing association. The Mehetnet neighbourhood has an active residents association as well as clear evidence of neighbours socialising. However evidence for residents’ high levels of social interactions beyond their immediate localities was presented in intranet planning sessions.

In Digcoop’s case, a request was made in the planning sessions for former residents to be able to access the intranet from outside the neighbourhood over the internet. A

group of former residents of the two streets that had become London Fields Solutions housing association had moved to Norfolk, and another individual to Epping, and residents were keen that the intranet should be enabled to support social interactions with these friends. I was asked if I would be able to set up a technical solution which allowed these former residents to login and access the services, including posting their own news, from their remote locations.

In the area served by Mehetnet, two intranet focus group meetings were held as part of Churchwell Residents' Association meetings. This illustrated the close alignment of the two groups' memberships but also exposed differences. The Residents Association included residents who were not currently able to connect to the Mehetnet community network, and Mehetnet included local residents who lived in streets outside the scope of the Residents Association. This led to debate as to what coverage the proposed Mehetnet intranet should have, and whether members of the Residents Association who were not able to connect to the internet via the Mehetnet wireless network infrastructure should be able to login to the intranet.

One proposal was that the intranet should be run by a Mehetnet member within the Mehetnet wireless network, but with security settings configured to allow named 'outsiders' to be able to tunnel in and access the intranet and participate as members (similar to the Norfolk and Epping friends of the Digcoop community). Another was that the intranet should be hosted on a remote internet site but password controlled by anybody defined as a member, regardless of location. This issue became an important debate within the community: what was the purpose of the intranet and who should it be for? Should somebody be withheld access if they lived within the

reach of the wireless network infrastructure but got their internet access from another service provider? Should somebody be given access if they couldn't connect to the Mehetnet community network but still played an active role in the social life of the local community?

Considering usage, the Digcoop intranet saw only limited interactions and conversations. Services that enabled social interactions were set up, yet few conversations happened apart from on a small number of occasions (e.g. when the planning application was announced to build a tower block overlooking the neighbourhood). However, many residents became active users of internet based social networking tools when became available. Few such tools were widely available during the research period (for example, Facebook had yet to be launched) but instant messaging and chat were popular tools that residents used with friends outside of the community. One particularly popular social tool used by Digcoop members was music sharing, and residents were agnostic in their choice of whether to access music from friends within the network or beyond. The initiators had felt that supporting music sharing locally would be a valuable service, and had been enthusiastically adopted elsewhere, in Redbricks for example (Skyva 2002). Local caching of files to enable faster downloads within the network rather than beyond was explored but due to lack of development time not carried through by the lead members during the research period. The barriers to local adoption seem to be technical, not being able to always access a neighbour's music server; and cultural, not finding the selection of music you were looking for. Residents appeared to access music wherever they could source their favourite tunes, and did not go out of their

way to favour intranet connections before using internet tools. This example reflects the local vs. ego-based relationship hypothesis, but also the critical mass hypothesis.

In summary, I consider that the hypothesis that a local intranet is not likely to succeed because people are as interested in communicating with friends defined by mutual interest (“ego based relationships”) as much as friends defined by locality is a strong argument in the case of Digcoop and Mehetnet. In both cases though it is clear that residents’ locality and communication with their neighbours is felt to be important.

The intranets themselves became local artefacts and catalysts for community engagement and interaction. It would be of interest to research further whether the local vs. ego-based interactions hypothesis is part of a critical mass debate and larger communities with more residents would engender more intranet conversations and interactions.

7.7 Hypothesis 4: Local resistance to outside intervention

The fourth hypothesis is whether the development and implementation of an intranet represents an outside intervention that local people resist as being outside interference. Arnold et al. describe this as “resistance to social engineering” (Arnold, Gibbs et al. 2003, p.12). Externally driven community networks identified in Chapter 2 have experienced the same situation, such as the Wired Up Communities project.

While the Digcoop and Mehetnet intranets, like the Williams Bay intranet, were “developed and sold with a genuine utopic desire to improve the community and the social relations of [their] members” (Arnold, Gibbs et al. 2003, p.13), a key goal of this study was to collaborate alongside community members to establish locally run intranets, so I would not have expected this to be a significant issue.

The proposals for establishing intranets were developed with lead members of the existing networked communities, and I was very careful to structure meetings with these leaders so they were run as collaborative events, driven by the expressed wishes of the local community through participatory activities. While Arnold et al.’s work explores how a community reacts to external technologies imposed upon a social group, my research has focussed on how local communities develop their own resources. Conscious of my position as an external researcher rather than a resident of either community, I worked hard to carry out participatory research methodologies and attempted to be critically reflective of my practice.

It is important to consider how the two communities perceived me. While I was offered much goodwill, perhaps out of curiosity and politeness, some residents may have felt that my actions were those of an outsider using a research approach that they considered inappropriate. This may have contributed towards a reluctance to contribute as we developed the intranets. As a former resident of the community supported by Digcoop, I was still in social contact with many of the residents and had not expected this to act as a significant factor. As a newcomer to the Mehetnet community though, it must be considered as a possible contributory factor.

A second related aspect of note is whether the goals of the initiators within the communities were representative of the wider community. While I worked closely with the initiators, attempting to align my goals as closely as possible with them, I had limited access to the wider body of residents. The lead members may have acted as gatekeepers and their goals and ambitions may have differed from the broader membership. For example, Dave, one of the Digcoop initiators, noted that one of his motivations was to learn about networking , but this was not necessarily a goal shared by community members. On reflection Dave felt this differing motivation may have affected the progress of the community intranet (Smyth 2009). As the fieldwork continued it became apparent that the neighbourhood Digcoop served had clear social factions, and roles played by residents in running both the housing association and Digcoop affected neighbourhood relationships. Internal politics may have therefore played a role in how well proposals for running and utilising an intranet from the lead members were received. As an outsider, I was not aware of internal politics within the Mehetnet community (and Churchwell Residents Association) though these may have played a role in determining whether or not the intranet was accepted.

Arnold considers the operation of the community intranet as being potentially at odds with the informal nature of local interactions. As a technical construct, a community intranet has a structure and forces interactions into structured modes that may be at odds with existing styles of communication, therefore the community may reject the intranet as a suitable means of interaction. As has been noted in Section 7.5, both communities have made wide use of internet-based network tools, so I believe this was not a significant issue.

In conclusion, I do not think local resistance to outside intervention, or the perception of the community intranet as social engineering was a strong factor in affecting its uptake in either of the two communities.

7.8 Hypothesis 5: Domestication

The fifth hypothesis to explore is whether the introduced technology was alien to people's social practices and hence not accepted: if the community intranet failed to be 'domesticated' into people's lives. Arnold et al. ask if "the [has] intranet been 'recognised' and 'identified' as a useful domestic artefact?" (Arnold, Gibbs et al. 2003, p.15), while Gaver et al. ask to what degree "people accommodate successful designs to their existing domestic activities and rhythms", and how much they persist in its use and interpretation over time (Gaver, Bowers et al. 2009, p.2219). This hypothesis is harder to explore in Mehetnet than in Digcoop as the intranet did not run within the research time frame. However we can also explore both the intranet usage (in Digcoop's case) and also the usage of the network infrastructure (in both cases) and consider whether these offer indications as to whether an intranet, once established, would have been domesticated.

In Digcoop, a small number of people regularly checked the intranet for new postings, though limited use of social networking services was noted until the community rallied round the issue of a local building development and had a reason to post on the intranet forum. More subtle and persistent usage of the intranet was witnessed with the 'traffic light' tools indicating current state of the local intranet and

external network access presented on the Digcoop intranet home page. This was one of the first tools added to the home page of the community intranet and while it was rarely remarked upon, the state of the traffic light graphics (green/amber/red indicating the state of connectivity) were frequently referred to when calls were made to the team asking for help. Furthermore several members noted that the intranet home page had been set as their computer's home browser page in order to understand the quality of service when planning any web activity. For some members at least, the community intranet was incorporated into their everyday practices.

The outstanding instance of high activity on the Digcoop forum were the postings about a proposed tower block to be built nearby. Coming several months after the launch of the intranet, this suggests both that members persisted in their usage of the intranet, discovering new functionality and exploring how it might be used. However the drop-off of usage after this point suggesting that a tipping point had not been achieved. When a group of members identified the intranet as the best place to post copies of their letters to the council, hoping for comments and responses from their neighbours, the initiators of the community network felt that a corner had been turned. Forum usage picked up and the community intranet was more frequently watched. Lead members anticipated that further discussion threads would break out and that the forum was starting to take off. However, while a few more threads were opened and limited posting occurred after this point, activity died down and the community forums largely became dormant again. Members indicated that they were also using other social software tools on the internet, so while domestication had happened other arguments such as critical mass may have come into play to hold the intranet back from being largely adopted as part of people's social practices.

In Mehetnet, it is difficult to consider whether domestication was a contributory factor as the community intranet did not go live. However, we can speculate by considering the development process and other similar tools available to the membership. There was continued interest in the focus group meetings with a good proportion of the Mehetnet community network membership attending contributing suggestions for what tools and services they would find useful. In several cases, members indicated use of intranet services at their work place and considered this to be part of their working practice so we could assume that when transferred to their home environment, they would incorporate their community intranet into their domestic practices. Also, the externally hosted Mehetnet mailing list, set up before the research period, was well used by members for technical support and local community engagement activities. This could be taken as additional evidence that community intranet services were likely to be domesticated by the Mehetnet membership. Conversely, while participants will declare their liking for technologies that enable community interaction (“who could not like and agree with anything that hopes to promote the values of community [...]?” (Arnold, Gibbs et al. 2003, p.14)), actual usage and domestication is a far different proposition so it is necessary to be cautious in making any predictions.

In summary, while it is not possible to conclusively prove that domestication was a significant barrier to adoption, evidence suggests this was not a major factor in the low take-up.

7.9 Hypothesis 6: Sponsorship

The sixth hypothesis is whether a lack of sponsorship affected the development of the community intranets. Damsgaard and Scheepers identify lack of sponsorship as the first of three existential crises that can affect the success and sustainability of an intranet: “if a sponsor does not nurture the intranet, it cannot evolve beyond its experimental beginnings” (Damsgaard and Scheepers 2000, p.131). They declare that an intranet needs both technological and political sponsorship to succeed. As a technical system, it needs a sufficient level of technological expertise to get up and running. Furthermore, champions are required who can communicate well enough to present this “... ‘foreign’ innovation to fellow organisational members who are potentially interested in the technology’s use or development” (ibid., p.134). As a system operating within a social and political environment, it requires sponsors who “have sufficient funds and the authority to facilitate organization-wide adoption of the technology” (ibid., p.134).

In Digcoop, there was a team of three core technology champions who developed the intranet and promoted the innovation to the community. From Digcoop’s inception, this team had promoted the concept of an intranet as an integral part of the networked community to the local residents. As Damsgaard and Scheepers note, technology champions need to be not only technically competent but also “politically capable of understanding problems associated with intranet implementation” (ibid., p134). The technology champions in Digcoop were socially and politically active in encouraging the membership to try out the intranet, and were aware of the need to seed the intranet with initial activity to make it attractive to local residents (content as well as

tools and services). Early adopters of the community network were targeted as potential participants of the nascent intranet and encouraged to explore and make postings. However, the energies of the champions were split between developing and promoting the intranet, whilst also operating the underlying community network infrastructure. This was still being improved, new members were being connected, and failures had to be resolved. This upkeep detracted from the time the champions had to focus on what they saw as the next stage in the networked community's development.

The technology champions promoted the intranet to the leading members of the housing association, representing authoritative voices within the community. The housing association's leading members had both access to budgets to fund developments and also organisational information needs that could be supported by an intranet (e.g. publishing and archiving of minutes from meetings, storage of documents, requesting members' input). At the outset these representatives showed enthusiasm for the intranet with promises of funding offered. However, this did not translate into significant action, with only one housing association representative posting minutes of meetings via the network, and another archiving minutes on the intranet. Communication of housing association business did not move to the intranet.

A significant problem was that of control. Damsgaard and Scheepers declare that for an intranet to flourish, "a sponsor takes control of the intranet, effectively 'grabbing' the technology from the champion(s)" (ibid., p.140). In Digcoop there was resistance by the technology champions to cede control to particular members of the

housing association. This tension continued throughout the fieldwork research period, with technology champions torn between wanting to see the intranet taken up and used more widely, but on the other hand not wanting to hand over any of the management responsibilities. Damsgaard and Scheeper suggest that as the intranet becomes functional and reaches the point of “contagion”, the technology champions should move to the background and the sponsors should take over (ibid., p.140). However, the technology champions suspected the motives of specific members of the housing association. The champions maintained a guarded distance, passively dissuading further interactions. They were caught in a dichotomy, needing the political sponsorship of the housing association, with servers housed in the housing association office, and network equipment and cabling running over housing association property, and keen to see the housing association members using and promoting the intranet services. On the other hand they did not want to give up control over access to administrative rights of the system or accept financial support in exchange for political influence over the direction of the intranet.

In summary, in Digcoop’s case sponsorship was a complicated issue. While it was offered in principle, this did not translate in practice to activity by the housing association members, and it was resisted by the initial technology champions who were unwilling to hand over control.

With Mehetnet, the promotion of the intranet was carried out within the community by Anna, the sole local technology champion, and myself, recognized by the local community as an outside community networker and a university researcher. We fulfilled Damsgaard and Scheepers expectation of how an intranet is introduced into

an organization, initially informally, with “no well-defined boundaries, formality, or time span” (Damsgaard and Scheepers 2000, p.133). The Mehetnet team developed their proposal for a community intranet in collaboration with the wider community from its inception. Additional to the technology experts, the ‘intranet team’ consisted of active supporters of the networked community and members of Churchwell Residents Association. Discussions regarding the development of the intranet were part of the Residents’ Association meetings and the technology experts were dispatched to implement requests between such meetings.

‘Political sponsorship’ was less of an issue for Mehetnet than Digcoop as participation in its development was integrated across the active membership. Little financial sponsorship was required and in common with other activities of networking communities, the approach taken was low budget, open source and DIY. Capital investment required for equipment amounted to the acquisition of a PC, donated by the Open University, and some configuration time by the technology team. Having identified that Anna was using the Drupal content management system at her workplace and was comfortable with this as an intranet platform, I configured a standard version of this software, brought the PC to London and set it up within the Digcoop network, with network access permitted to Anna. However development of the Mehetnet intranet stalled at this point. Despite encouragement, and repeated email and phone contact, Anna did not develop the basic installation with either services or content to the point that it could be made available to lead members of Mehetnet. Anna had logged in on a small number of occasions, but did not pursue the development any further. As an outsider to the community, and the academic researcher, I did not feel it was appropriate for me to take the lead. Therefore the

intranet service was not developed to the point that it could go live, or even be tested by early adopters within the Mehetnet community, before the end of the fieldwork period.

In summary, political sponsorship from within the organisation does not seem to have been a significant blocking point for the development of the intranet, however the lack of technology champions' time to develop the intranet to a stage where it could be promoted to the community was a major factor. In Damsgaard and Scheepers terms, the Mehetnet intranet did not move past the "initiation" stage of development.

Overall, sponsorship in Damsgaard and Scheeper's terms was offered in both networked communities. However in Digcoop, this was in part resisted by the technological champions and complicated by internal community politics, while in Mehetnet the resources were not in place to deliver a working intranet.

7.10 Hypothesis 7: Upkeep

The seventh hypothesis is to consider whether enough attention was paid to the intranets' upkeep. Damsgaard and Scheepers propose that it is critical for an intranet to be well maintained and under control, otherwise it will grow wild and eventually become chaotic, resulting in a "wilderness of information [that] becomes impossible to manage and update" (Damsgaard and Scheepers 2000, p.138). If an intranet is allowed to develop without control, they declare that the information will be "perceived with mistrust" by members of the organisation, that the content will

become dated and people will look elsewhere for more reliable sources of data (ibid., p.138). As less people contribute and visit, the intranet site will stagnate and become less relevant.

With Digcoop, the intranet was set up during the research fieldwork period and ran until and beyond the end of this time, giving time to observe its upkeep. Initially, there was little usage of the intranet despite promotion by the technology champions. During the research period several discussion threads picked up, notably the debate over the proposed neighbouring towerblock. Following this discussion, and some exploratory postings by a small number of members, regular usage declined. Tony, as the lead for the intranet, posted updates and tested new services throughout the research period and encouraged early adopters to try out his new tools, but found little response. Damsgaard and Scheepers consider upkeep as it applies to an active intranet, where major issues include policing errant postings, and managing increasing numbers of documents. Digcoop, however, faced the opposite challenge, that of encouraging participation. The intranet continued to stay online, Tony posted messages and presented new services, yet little usage was made. Thus ‘upkeep’ was not a problem as the technology champions promoted the intranet, monitored usage and freshened its appearance, but rather the site stagnated with no online community developing and not enough content of interest drawing in an audience.

In this sense the intranet could be said to have fallen to Damsgaard and Scheeper’s third existential crisis, upkeep, as it was not seen as a relevant source of information for the community members. For housing association business, email, paper, and face-to-face transactions remained the norm; and for socialising, phone, email, face-

to-face and internet-based software tools (e.g. music sharing, posting boards) were the preferred option.

With Mehetnet, the intranet was not launched to the community during the research fieldwork period, so upkeep cannot be considered as an issue. However, the key communication tools for community discussion during this period were maintained: the internet hosted mailing list moderated by Anna, the technology champion; the network infrastructure for Mehetnet, and regular meetings of the Churchwell Residents Association. We might hypothesise that there were positive signs of broad community involvement that indicate that upkeep would not play a significant role in holding back the intranet's development and continued use in the future.

One aspect of upkeep not considered by Damsgaard and Scheepers may have played a significant role in establishing and maintaining the intranets in both communities: training of community members. As the services were proposed and developed in both communities it could be considered important to ensure that the community members were kept up to date with developments and trained in the new tools. In both communities, however, this was carried out in an informal manner rather than in an organised, strategic approach and this may have affected the development of the two intranets.

7.11 Hypothesis 8: Surprise

The final hypothesis to consider is surprise. Gaver et al. argue that an indicator of success for a technical system is if users continue to persist in using systems over

time and experience new aspects that enrich their experiences: “new surprises and new insights” (Gaver, Bowers et al. 2009, p.2220). New content might appear that the users do not expect, or continued use of the system might reveal new ways in which it can be used or appropriated that had not been anticipated at first sight. The reverse of this might also indicate the failure of a system; if users do not experience surprises and new insights, there is less incentive to persist in using it. Gaver et al. describe this as a vicious circle, because without persistence of use and accommodation in the users’ domestic routines, they are less likely to experience possible surprises and new insights, and so this failing loop will continue.

In Digcoop, with intranet running for the majority of the research fieldwork period, there was time to investigate whether “new surprises and new insights” played a significant factor. Innovations were added to the intranet by lead members, and new users joined during this period. However there is only limited evidence that surprise played a part in encouraging the take up of the intranet, and more evidence (through absence of activity) that there was a lack of persistence of use. The tower block planning protests provide one instance of new purpose being found for the intranet. One of the core users of the network and intranet services posted a message onto the previously neglected message board, announcing that he was going to attend the council meeting. Several members replied to this message, one of whom posted a copy of the letter that they would be writing to the local council. The intranet was perceived in a new light as a tool that had an affordance otherwise not easy to achieve.

Overall, there was persistence of use by a number of members, however with few exceptions there is little evidence of the intranet provoking surprise and increasing use and acceptance as a result.

In Mehetnet, the intranet was not launched to the community during the research fieldwork period, so it is not possible to consider whether surprise played a role in hindering development. During the research period the externally hosted mailing list continued to be active and used in different ways by the community, which might indicate that if an intranet had been set up and run then we would see persistence in use by members and experimentation with functionalities that could lead to insights into new ways of using the tools and services as presented.

In summary, in both communities there was persistence of use of a broad range of tools, though Digcoop saw little innovation of intranet use, and this could not be tested in the case of Mehetnet.

7.12 Summary

In this chapter I have explored what factors may have affected the uptake of the community intranets within the two networked communities, Digcoop and Mehetnet, using eight hypotheses aggregated from three key works.

When considering the implementation of the Williams Bay Intranet, Arnold referred to the Pew Report on online communities (Horrigan 2001) that indicated that users largely embraced social and local interaction when going online (Arnold 2003).

Similarly, the hope of this thesis was that the two communities would have taken up and embraced social software tools within their networks, given their enthusiasm for the idea when first approached. The original goal of the collaboration was to understand factors that might lead to the successful adoption of social software tools within the communities. However, while the widespread adoption of the intranets by community members did not occur within the research fieldwork period, it opened up the alternate opportunity to explore barriers to the adoption of social software.

Reviewing the aggregated hypotheses we can now examine which factors may have played a greater part in limiting the successful uptake of the intranet in each of the communities.

<i>Factors</i>	Digcoop	Mehetnet
Critical mass	Strong	Strong
Unsuitable application	Weak	Weak
Local vs. ego based interactions	Medium	Medium
Local resistance	Very weak: (though local politics)	Very weak
Domestication	Medium	Not applicable
Sponsorship	Weak	Strong
Upkeep	Strong	Not applicable
Surprise	Medium	Not applicable

Table 7-3: Relevance of factors in affecting the development of the community intranets

Turning first to Digcoop, key factors limiting the take up of the community intranet were ‘critical mass’, and ‘upkeep’. ‘Local vs. ego-based interactions’, ‘domestication’, and ‘sponsorship’ were also contributing factors. Digcoop appears to have mostly struggled with applying the necessary resources to setting up and promoting the local intranet, and then continuing to attract members to its use. This was partly due to the lead members’ divided focus between the intranet and maintaining the underlying network infrastructure. It is likely that the team was too small, or could commit too little time, to be able to take on the task required of them. This was further complicated by the political struggle within the organisation, torn

between pressing the housing association to adopt the intranet as its primary means of communication measured against reservations of the motives of some of the housing association representatives.

The majority of Digcoop members expressed an initial enthusiasm for establish an intranet and using locally run social software, but this did not translate into great usage of the services provided. While persistence of basic usage was noted, there was little evidence of incorporation of the intranet into the communicative ecology of the members, and its domestication into their daily routines. This was hinted at in one of the initial user interviews at the beginning of the research period, when one member noted “if I want a chat I’ll go round to my neighbours for a cup of tea” (Burke 2003). The Digcoop membership took a very pragmatic approach to network services, only using them when they offered functionality that improved on existing options. Digcoop members were not shy of using internet services; indeed a major challenge for the technology champions was managing file sharing and video and audio downloading across the network, and many members embraced social software tools as they appeared on the internet. Arnold et al.’s observation that while local community is important, social networks are much greater than just neighbourhoods is significant in Digcoop’s case.

In Mehetnet, the intranet did not experience any community activity during the research fieldwork time period. The major factors affecting this were ‘critical mass’ and ‘sponsorship’, with ‘local vs. ego-based interactions’ as a contributing factor. The major issue was the lack of resources to get the intranet up and running, with all efforts dependent on a single local technology champion’s availability (Anna). When

she was not available, the initiative stalled. More so than Digcoop, Mehetnet struggled to maintain a stable network infrastructure, and during the research period much effort was expended on managing, analysing and developing this rather than the intranet. Due to Anna's wide range of commitments, she was not able to dedicate time to developing the intranet. Hence we can look to Damsgaard and Scheepers and note that within the research fieldwork period, Mehetnet was caught in their first identified existential crisis, the need for sponsorship to allow the intranet to "evolve beyond its experimental beginnings" (Damsgaard and Scheepers 2000, p.137) and reach a wide range of potential users. If I had intervened to a greater extent and brought more resources to bear, the intranet might have been developed to the point where it could be released to the Mehetnet community. However I felt this would have contravened the research methodology, and I will examine this issue further in the next chapter.

A contributing factor that coloured the Mehetnet focus group debates during the research period was the tension between local and ego-based interactions. The debate about who would be given access to the intranet (just Mehetnet subscribers, members of the Churchwell Residents Association, other neighbours in the area, or anybody with an interest in the local community including distant friends and ex-neighbours) was an issue that concerned the active Mehetnet members and proved to be an ongoing point of contention. Like Digcoop, Mehetnet members struggled with the question of what the boundaries of their community were.

7.13 Conclusions

The exploration of the barriers to adoption leads to five general conclusions:

1. Goodwill does not necessarily translate into action

Despite the initial goodwill expressed by members of both communities, common usage of intranet services did not occur within the fieldwork period. This echoes Arnold et al.'s experiences in Williams Bay, where the authors note that it is normative to like the idea of a community intranet: it is hard not to like the idea of a tool that will promote community cohesion. Engaging in action, however, may be another matter. In Williams Bay, Arnold et al. found little usage by some members "... (b)eyond any explicit declaration of liking (which, after all, might be made out of sheer politeness)..." (Arnold, Gibbs et al. 2003, p.2219) and it would appear I have experienced similar situations here in Digcoop and Mehetnet.

2. There may be an optimal size of neighbourhood for a successful grassroots managed community intranet

While I have previously described examples of externally driven networked neighbourhoods that were too large to generate a sense of community and participation, it may be also true that too small a community will struggle to support a community intranet. A minimum level of resources is needed to make an intranet viable, which in most cases is likely to imply a minimum size of community. In exceptional cases, there may be situations where highly motivated participants can

run an intranet in a very small community. However, in most instances the lead members have to balance the time that they can spend in developing, promoting, and maintaining the networked community with other commitments so a minimum team size is required. A minimum level of participation by the wider membership is also required to ensure content is vibrant and of a sufficient quantity to ensure participation and not lead to stagnation.

3. Appropriate timing of the development of an intranet is critical

The timing of when a community intranet is developed is critical. In both communities with which I collaborated, the lead members were still struggling to consolidate their network infrastructure. The time they could dedicate to the establishment and maintenance of community intranets was therefore limited. The broader membership were also as concerned with being assured of a reliable service as they were with exploring additional services. It may have been that the collaboration in these cases was undertaken too early in the lifespan of the networked communities, and that appropriate timing for such a development is critical.

4. Internet based social software may have diminished the value of the intranets

On the other hand, the collaboration with the two communities may have occurred too late. As the intranets were being planned and developed, there was a global surge in internet based social media tools such as Facebook, which had not existed at the beginning of the research period. These were rapidly assimilated into the practices of the Digcoop members, and Mehetnet members also indicated their usage. It may be

that the establishment of intranets in the two communities was undertaken at the point at which locally run social media tools became less important to members of networked communities.

5. Fixed timescale of research too closely resembles an intervention

A final note of caution to consider is that while the intranet development was undertaken as a collaboration between the technology champions in the communities and myself, it was nevertheless undertaken in a set time frame, at the end of which results were measured. This moves the research approach dangerously close to that taken by externally driven interventions and criticized by Day and Cupidi, that a project based approach over a finite time span is less likely to succeed than an open ended initiative based approach which allows for an indefinite time frame to reach a conclusion satisfactory to the community itself (Day and Cupidi 2004b). Grassroots initiated networked communities may grow and mature over differing timescales, and reporting on them after a set time period may not allow an accurate estimation of whether ‘success’ have been achieved.

In the next Chapter, I will draw together the research and reflect upon what has been learnt. I will consider:

- The current state of the digital divide; how the discourse has developed since the research began and current challenges

- The state of grassroots initiated network communities studied, their current challenges and a reflection on their validity as a means of overcoming the digital divide
- The suitability of the research methodologies used during this research

8 Summary of work and reflection

8.1 Introduction

The aim of this chapter is to summarise the research undertaken during the investigation, and then to critically review what has been found. First, I reconsider the concept of the digital divide; what has been learnt in the research and the state of the current discourse surrounding the concept. I then consider grassroots networked community initiatives, examining their current state, and to what extent they have been able to address the digital divide. I finally reflect upon how effective the chosen research methodologies have been in exploring the research proposals.

8.2 Reflection: The digital divide

A key goal of the research was to critically evaluate the digital divide discourse through the lens of community informatics and understand how it has affected network provision in the United Kingdom. Since the research was started in 2003, there has been continued discourse that has helped improve the understanding of the concept, and some action on overcoming digital divides in the UK. However, at the time of writing (2011) policy making still focuses on very simple interpretations of the divides and as a result provision remains of varying quality across the UK with many issues raised in this thesis currently needing to be addressed. Over the years there have been claims made by policy makers that the digital divide would very shortly be overcome, with universal access “by 2005” (Cabinet Office 2000), then

“by 2008” (Cabinet Office 2005). The latest estimate is that everybody in the UK will have access to at least a 2Mbps connection by 2015 (Amos 2010). The focus of this rhetoric still remains focused on access, and the speed of that access.

Exceptions to provision still remain: as of March 2009, 1.5 million homes were still unable to access broadband internet (Wray 2009). The digital divide, therefore, is still a significant issue. The expectation, perhaps, has now shifted to assuming people are connected; the recent 2010 UK government white paper reforming social benefits expects transactions for social benefits in the future to be “normally be made through the internet and [...] that most subsequent contact between recipients and the delivery agency will also be conducted online” (Department for Work and Pensions 2010, p33. Section 5). The idea that social benefits claimants “will be expected to manage their claims as they would an online bank account” (BBC 2010a) has raised concerns amongst charitable organizations who note that the most vulnerable are least likely to be online (e.g. (Advice NI 2010)) and in 2010, 21% of adults said a lack of skills prevented them from going online (Office for National Statistics 2010).

It is likely, therefore, that local activism will continue to have a role to play in ensuring more equitable access and usage across the UK to help convert online access into online participation. For example, BT (the UK national telecom provider) has recently announced a ‘Path to Infinity’ programme to connect the UK up to fibre optic cabling and offer faster speed internet across the country. However, a document leaked in 2010 noted that the first five locations to be connected were all in London (Williams 2010). Small rural communities are unlikely to be included in the upgrading programme as they have “too few residents to be eligible” (Cellan-Jones

2010). The digital divide between large urban areas and less profitable communities seems set to continue. Self-provisioning initiatives continue to offer a valid alternative to overcoming situations where no connection can be achieved through large telecoms providers (Ray 2010), or to improve existing slow connections. The village of Erbstock, near Wrexham, for example, was asked to pay over half a million pounds by BT to achieve broadband connectivity, while a small commercial provider, working alongside the community, was able to set up an equivalent service for less than £50,000 (BBC 2010b). Elsewhere, communities are looking to local initiatives to offer them an alternative path to high speed optical fibre connections (“fibre to the home” or FTTH) where BT will not commit to provision or is quoting very high prices. Some of the grassroots networking initiatives that originally formed to connect their neighbourhoods with broadband are now moving to connect their community with higher speed fibre; for example Cybermoor, in Alston Moor in Cumbria is now re-inventing itself as “Fibre moor” and is aiming to connect all residences in the area to 100Mbps connections (Independent Networks Cooperative Association 2010).

Other grassroots networking initiatives have moved focus as the network connectivity in their area has improved (either through their efforts or the pressure they have applied to government and telecoms providers) and provide services that move beyond access to overcome further inequalities. Consume, the London wireless pioneer group has formalised one aspect of its structure as Boundless, while providing internet and software training at its headquarters, Backspace, including a drop in session every Wednesday afternoon for local residents. Redbricks in Manchester continues to provide internet access to the residents of the Hulme Estate

but is now focusing more on community interaction and intranet services as the ‘Redbricks Intranet Collective’. Multiple digital divides are still to be overcome and grassroots initiatives still have a role to play.

8.2.1 Open data: a new domain yet facing the same problem

As new online tools and services become available, the same digital divide issues appear to be arising, but in new domains. Recently there has been a drive to make available data sources, particularly public funded but also commercially generated, to the general public (e.g. (O'Reilly and Malamud 2007; Davies 2010)). These include resources such as mapping data⁴⁵, genome maps⁴⁶, and government expenditures⁴⁷. In some cases this has been initiated by the owners of the data, such as government bodies⁴⁸, but often the data has been made available in response to public pressure. The generic term for this approach is the ‘open data movement’ (Berners-Lee 2010), and this refers to both the making available to the public of the data, and its provision in a format that allows direct manipulation by any party without the requirement for proprietary software tools. However, there “appear[s] to be some confusion as between movements to enhance citizen “access” to data and the related issues concerning citizen “use” of this data” (Gurstein 2010b).

As with the digital divide described in this thesis, politicians still appear to be confusing equitable usage with equitable access. Providing the data sources to the

⁴⁵ e.g. Ordnance Survey’s open mapping space: <http://openspace.ordnancesurvey.co.uk/>

⁴⁶ e.g. The cacao genome project: <http://www.cacaogenomedb.org/>

⁴⁷ e.g. <http://wheredoesmymoneygo.org/>

⁴⁸ e.g. <http://www.data.gov.uk>

public does not mean that they will be able to interrogate it; the data may take the form of very large data sets, requiring software tools for analysis, and a level of expertise to analyse and to operate the tools required to generate meaningful interpretations from the raw material. Like the digital divide described previously in this research, there are multiple layers of inequality to overcome. While providing access to the data is a necessary step to move towards citizen equality with respect to manipulation and interrogation of the sources, it does not necessarily allow for effective usage of the released source materials. DiMaggio and Hargittai's multiple forms of inequality (technical, autonomy, skills, social support and purposes) described in Chapter 2, appear to be applicable here and for citizens to make effective use of the opened up data, a number of preconditions again have to be achieved. The actual number of citizens who are able to effectively interrogate the released data is limited due to the barriers that need to be overcome, and similar challenges need to be faced. Gurstein (2010a) argues that effective ownership of open data can only be successful when a three step process is achieved, consisting of "access", "interpretation" and "use".

However, a parallel is emerging with the digital divide discourse. Just as this thesis has noted the emergence of grassroots activism responding to existing digital divides, similarly it appears there are activists and advocates also seeking to overcome this new divide. In the open data movement it is possible to see 'pioneers' and 'subcultures' bridging divides and enabling wider public usage of the newly made available data, providing tools and expertise. In many cases these activists undertake the role of intermediary expert and are releasing information in more accessible formats (e.g. TheyWorkForYou.com providing an interface to the UK government's

Hansard Records on politicians voting histories). In some cases, enthusiasts are also providing training to enable others to learn how to query data sets themselves, such as the UCLA Centre for Health Policy Research offering training in the exploitation of its California Health Interview Survey. This led to a group of community advocates fighting against the building of a new highway truck stop in their local area, based on the evidence of asthma symptom prevalence in their county (UCLA Center for Health Policy Research 2009). Social software is often used as a means of publicising and displaying the data, supported by tools written by pioneering groups, and in some cases supported by data providers themselves.

A more nuanced understanding of open data availability is therefore appearing (e.g. (Eaves 2009; Davies 2010; Gurstein 2010b)) and the same debate is being played out. The research undertaken in this thesis may itself provide a lens through which the open data challenge can be explored and better understood.

8.3 Reflection: grassroots initiated networked communities

A key aim of the research has been to understand how grassroots initiated networked communities might address the digital divide.

Proposition 2 of the research argues that:

“Developing a bottom-up networked community project based within an existing community of locality, where there is already a significant level of social interaction, is more likely to succeed than implementing a top-down networked community project into an arbitrarily selected community.”

I have examined both top-down networked community projects through the literature, and explored bottom-up networked communities more closely through the literature, a survey, interviews with ten groups, and collaborative research with two groups. It has become clear that success is difficult to measure. One major criterion is to consider whether the networked communities have managed to sustain their operation, and succeeded in achieving their goal of providing network connectivity and services to their identified community of locality. Six years after the fieldwork survey, this answer may be informed by revisiting the groups to see whether they are still in operation and what form they currently take.

<i>Group</i>	<i>Started</i>	<i>Type</i>	<i>Current status (January 2011)</i>
Redbricks	1998	Cooperative	Continuing. Focusing on intranet services and upgrading connections.
Yellowbricks	1998	Cooperative	Continuing. Focusing on intranet services.
Consume	1995	Pioneers	Continuing. Evolved into Space, and Boundless.
Backnet	2001	Pioneers	Ceased operations 2006. Lead members moved on to other activities.
Manchester Wireless	2003	Pioneers	Ceased operations 2007. Reduced to core group of enthusiasts in local area.
3-c.coop	2003	Cooperative	Ceased operations 2008. Customers transferred to The Phone Coop. Core team reformed as group pursuing next generation fibre to the home in the local area
East End Net	1999	Subculture	Continuing but reduced. Focus on network connectivity.
South Witham Broadband	2004	Cooperative	Continuing. Growing as local commercial provider, active in CBN and INCA.
Digcoop	2001	Cooperative	Continuing. Focus on network connectivity.
Mehetnet	2003	Cooperative	Continuing. Purchased mesh network, Focusing on connectivity.

Table 8-1: Summary of groups surveyed, and current status

Table 8-1 describes the current state (January 2011) of each of the groups interviewed as part of the 2004 fieldwork survey. It is encouraging to see that seven out of the ten groups continue to operate, suggesting their models are to some degree sustainable, however some have ceased operations whilst others have changed their

form. Analysing the groups by type, the majority of the Cooperatives are still operating, with only 3-c.coop ceasing its operations. East End Net (the Subculture) continues, and two of the three Pioneer groups have ceased operations. This may reflect the differing natures of the types of groups and the relationship of the lead members and initiators to the wider membership of their groups.

The Cooperative groups, led by members with strong ties to their neighbourhoods, representing groups linked closely to defined localities, appear to be more sustainable. The Subculture group continues, though its activities have diminished and it now focuses on providing network connectivity to its existing long-standing membership, and could be perceived as closer to a Cooperative. The Pioneer groups have fared least well, with only one out of the three continuing. In two cases, the Pioneer type groups have ceased operation with lead members ceasing participation in the groups. In the third case, the group has evolved, moving away from its role as a London-wide (or even greater) focus group for wireless networking exploration towards supporting more activity in its local neighbourhood. Consume has evolved into Boundless, developing and maintaining a wireless network across south east London, in the area around its headquarters, and provides a drop-in service for local residents whilst maintaining a focal point for networking experimentation.

Without further interaction with the groups, it is difficult to deduce some groups have ceased operation and others have continued. However, it is interesting to note that the Cooperative type groups seem to be more sustainable in the longer term. There appear to be a number of reasons for groups ceasing operation or changing in purpose.

8.3.1 External environment changes

External change is a major reason for groups ceasing their operation. The principle reason appears to be better internet provision being offered to a community, and making the networking group redundant as a result. The majority of the groups were formed at a time when internet provision across the UK was limited and expensive. With better and cheaper internet provision now being available for many areas (though not all, as noted in the previous section discussing the digital divide), groups who focused upon this as their main reason for existing are no longer as necessary. An example is the West Haddon and Winwick community network (West Haddon & Winwick Community Broadband Limited 2004). This group was set up to overcome lack of broadband provision to a village, at the time when BT would only provide connections when a minimum number of subscribers signed up for service. A local resident paid for a satellite connection, which was then distributed via local Wi-Fi from house to house, and the connections were managed by a local group set up for the purpose. However, this was the primary motivation for the group, and when BT later offered broadband to the village, the group decided to cease operations. This may have affected some of the groups studied in the research and it would be interesting to interview them further to establish to what degree their purpose has changed as cheaper and more readily available broadband has emerged. In 3-c.coop's case, like other groups across the UK, this has only shifted the goalposts and local residents' ambitions have increased, so some of the members from this group have now invested their energies to get their rural community connected with higher speed fibre optic connections to the home. As has been noted in the previous section on the

digital divide, like broadband, this is also only available in limited locations and it would appear the divide that occurred ten years ago with broadband is being repeated across the country with high speed fibre optic connections.

An issue that does not seem to affect the grassroots initiated networked communities is the withdrawal of external funding; unlike externally initiated networking projects the locally initiated groups have little dependency on government or commercial funding.

8.3.2 Resource issues

A group's access to resources can affect its ability to survive or grow. As noted in Chapter 7, upkeep is an issue that can affect the sustainability of groups. Internal funding can be a problem for grassroots initiated networked communities and the limits in funding, often dependent solely on user subscriptions can hinder development or progress. As Redbricks lead members have noted though, not having any money means you have none to run out of, and the grassroots initiated networked communities generally operate on shoestring budgets. A major issue which does affect these groups though is recruiting and maintaining sufficient volunteer support. This is an ongoing issue for most of the groups: Redbricks have a call for volunteers on their website (Redbricks Intranet Collective 2010) and 3-c noted in their final newsletter that "the lack of sufficient numbers of new volunteers" was a significant contributory factor to the winding up of the organisation in its present forms. For all community run, low budget, volunteer dependent groups this is an important issue (3-c.coop 2008) that has been frequently raised in

conversations. This matches both the upkeep, and critical mass hypotheses noted in Chapter 7 as barriers that groups need to constantly re-address.

8.3.3 Internal politics

Internal politics are a problem that has affected sustainability: the 3-c.coop website home page (accessed 16/12/2010) notes “ultimately we were let down by people we thought we could trust” (3-c.coop 2010). Like many other voluntary organisations, managing groups of volunteers and maintaining a shared purpose is an issue that the grassroots initiated networked communities have to face. The smaller groups avoid this by being run by a small number of people or even a single person: vortex described the management of East End Net as run by himself as a “benevolent dictator” (East End Net 2004), avoiding the need for debate about the direction of the group’s activities. However even the small groups can have differences of opinions leading to initiators leaving, and the leadership may differ in their opinions of the direction of the networked community: as noted in Chapter 7, Digcoop’s lead members found themselves at odds with the housing association’s management and this contributed to a slowdown in developments.

8.3.4 Motivation changes

The motivation for running a networked community may change. Goals may or may not be reached, the broader membership or the leading members may move on to different interests and no longer be concerned with the original purpose(s). For some

of the networked communities, notably the Pioneer type groups studied, this appears to be a significant reason for the group ceasing operation. As noted in Chapter 5 (Section 5.4.1.4) Pioneer type groups attract members interested in experimenting with new technologies and ways of working. Their communities are as much defined by interest as by locality. In the groups I have studied, they are more likely to have a more mobile membership, and in the time I have undertaken the research many of their members have moved elsewhere, or taken up other interests. Rob Kyle, one of the leading members of Manchester Wireless, moved from Manchester to Edinburgh having completed his undergraduate studies. When interviewed in Edinburgh, he reflected that while he was now occasionally helping the Edinburgh Backnet group, he felt he had learnt all he had wanted to about wireless networking and was moving on to other interests. Similarly, the Backnet lead members, both students at Edinburgh University, appear to have lost interest in maintaining their wireless network and have channelled their energies in other directions. One member is employed at Edinburgh University researching speckled computing, while another works in a local electronics company and is involved in the local Dorkbot⁴⁹ (“People doing strange things with electricity”) and Maker scenes (hardware and software hacking). Similarly, some of the members of Consume are now actively involved with London based hardware and software hacking scenes, with members taking an active role in Dorkbot-London⁵⁰ and Maker communities⁵¹. The hardware hacking scene, centred around newly available and affordable hardware devices such as Arduinos, and homebrew CNC-milling and 3D printing devices, became very popular in the mid decade, and it would appear that this has become the new passion for many of the people who were previously interested in grassroots networking.

⁴⁹ <http://dorkbot.noodlefactory.co.uk/wiki>

⁵⁰ <http://dorkbotlondon.org/>

⁵¹ e.g. <http://london.hackspace.org.uk/>

This change in focus is also true of the one example of a Subculture, East End Net. This group has had a turnover in membership with a number of the artists previously active and exploring the use of networking technologies as a means of supporting their art moving their interests to other areas, and moving out of the buildings to other locations across London. The small number of longer-term users is still supported by vortex, the lead member for the group, but he feels that there is no longer the need for community networking groups in urban areas due to the reduced costs and wider availability of network connectivity. He has also moved on in his interests, focusing more on open hardware projects, and so East End Net could be considered to have now become more like a Cooperative group.

The wider membership of networked communities may also change in their motivations leading to the decline or transformation of a group. While Redbricks has increased its activities, with intranet services expanding and a separate website run to promote activities within the neighbourhood such as a community cinema, urban food growing, and other local activities (Redbricks.org 2010), other groups have changed their focus. 3-c.coop has wound up as some members have moved to commercial internet providers, while others are still keen to improve their services, and in 2008 formed a new organisation to achieve fibre-to-the-home to the local area. In Mehetnet, the network has become part of the local community infrastructure but enthusiasm in its running seems to have waned; I was emailed in the Summer 2009 to ask if I could recommend a commercial hardware company to upgrade the network as the residents were keen to have the infrastructure as a shared service, but were not interested themselves in maintaining or running the equipment and were looking for an off-the-shelf solution. The lead member of Digcoop who had been

instrumental in the setting up of Mehetnet, Dave, separately reported to me in an interview that the residents are now very interested in keeping chickens, and have been asking about wireless webcams to watch their poultry in their runs over the local network; he suggested that “chickens are the new intranet” in this community (Smyth 2009).

8.3.5 Networked communities’ value as temporary interventions?

In summary, the landscape has changed, both within and outside the networked communities. After seven years, some groups have continued to thrive and look likely to continue while other groups have ceased operations. Therefore, should grassroots initiated networked communities be considered as temporary interventions? And if so, have they had any value or should we consider them to have failed if they have not proved sustainable in the long term? It might be argued that many of the groups, even those that have ceased operations have lasted longer than some of the externally driven network projects explored earlier in this thesis. Furthermore, where the grassroots initiatives have ceased operation they have done so (in the cases studied) with the agreement of the participating residents, or with a procedure undertaken to ensure residents have a continued service from another provider (in 3-C.coop’s example). The groups may be considered to have represented ‘Temporary Autonomous Zones’ (Bey 1991) where community activism has given local residents the opportunities to define their own environments and self-resource where alternatives have been lacking. It is not possible within the bounds of this research to understand what the long term value of the temporary intervention of the

grassroots initiated networked communities will have been, but this would be a valuable area to consider for the future.

8.4 Lessons for policy makers

This exploration of grassroots networking initiatives may also provide policy makers with useful guidance on how best to support local community responses to the ‘digital divide’ and provide a means to encourage digital inclusion at a neighbourhood level. Drawing on the research and analysis carried out in the production of this thesis, and also considering further reflection and additional work carried out with Ben Anderson of Chimera, University of Essex (Anderson 2004; Anderson and Gaved 2006a), I offer the following recommendations:

Policy makers should consider the role grassroots initiatives can play in supporting digital inclusion: a shift away from setting up high budget, limited timescale, pilot projects to providing longer term commitments to community-led initiatives may be more effective at addressing community needs, as the core membership are derived from and work within the host communities and are more likely to be aware of their requirements

Emphasise purpose before technology: community networking initiatives will not be used by the host communities if they don’t address community purposes.

Build social capital before introducing technology infrastructures: for a community networking initiative to succeed, emphasis must be placed on developing

or ensuring the presence of an active and enthusiastic core group of members, and acceptance by the wider local community. A social network needs to be well established for a technological network to be sustained.

Home access is preferred over local access: Telecentres provide an important “third places” (Oldenburg 1989) and are valuable in encouraging support, training, and cohesion across different groups within communities, but public access facilities are limited by staffing, social and cultural factors. Provision to the home allows participants the opportunity to access services at their own convenience.

‘Technological capital’ is required: smaller initiatives often struggle to develop and maintain the knowledge to effectively run a community networking initiative. Technological skills allow individuals to produce their own cultural products as well as being consumers, leading to increased social capital. Support needs to be provided both for the leaders of the initiatives and also to enable them to train the wider membership.

Utilise existing tools rather than developing new tools: there is a wide range of software tools and services available, and well supported by online communities and other activists. Consider these before developing custom software packages, as they already well tested, and have a large user community that can support their usage.

Support collaborations between grassroots initiatives: encourage and support opportunities for knowledge exchange between initiatives, both online (such as websites, forums, newsgroups) and face-to-face (such as conferences, workshops, and mentoring). Support the development links between groups, either as informal

collaborations or the setting up and support of formal associations, as this provides the opportunity for individuals to work together and appears to create the most resilience within networking initiatives.

Enable initiatives to undertake reflective thinking: Policy makers need to support grassroots activists to enable them to engage in reflective thinking beyond their day-to-day concerns (managing their initiatives) and carry out their own research, or participate as equal partners in externally supported research projects. The goals of policy makers and academics are often seen as irrelevant or too abstract by community activists, and their involvement is seen as getting in the way of ‘real work’. However, grassroots initiatives benefit when lead members are given the support to be able to step away from their immediate concerns and reflect on the work they and their peers are undertaking.

Ensure exit strategies for funded set timeframe pilot projects: There should be an explicit strategy to transfer control of externally initiated and funded pilot project to community self-provision and ownership during the lifetime of such projects. Many examples exist of limited timeframe projects collapsing when central funding ceases or paid project staff reach the end of their contracts. An exit strategy and plan for continuity must be in place to ensure benefits are not lost, and encouraging community ownership is a viable means of assuring continuity. Local stakeholders must be helped to take on board the management of the project and its transformation into a locally run initiative.

8.5 Reflection: methodological challenges

An important aspect of the research is to reflect on the methodologies used and consider their appropriateness. It is possible to consider their shortcomings and the dilemmas faced, and how I might consider improving the approaches taken. As Maanen et al. note, “fieldwork... raises serious and certainly heartfelt questions about one’s competence and self-identity, the worth of one’s work, the moral responsibilities associated with the short- and long-term relations one develops with others in the field” (Maanen, Manning et al. 1993, pp. vii- viii).

Although the research progressed less smoothly than hoped, examining both the successes and difficulties is valuable. Gaver et al. note: “Although it is commonly argued that failure is instructive, reports of failing designs are rare in the literature” (Gaver, Bowers et al. 2009, p.2213). It therefore will be useful to reflect on the failings as well as successes of the approaches to inform future researchers.

Beyond the literature review, I took four approaches to the research:

1. A snowball method to identify the grassroots initiated networked communities
2. Semi-structured interviews with lead members and initiators of communities to understand their goals and their communities, combined with community observations
3. Participatory research alongside the community members in two groups
4. Observation of the development of the Digcoop intranet and its usage

I will consider each of these in turn and then look at overarching challenges.

8.5.1 Identifying communities using snowball method

I used a snowball method to identify grassroots initiated networked community groups (Atkinson and Flint 2001), triangulated with knowledge gained through my participation in the domain as a practitioner, and keeping abreast of literature, including online spaces such as forums and activist websites. My hope was that this approach would rapidly identify a network of communities, and also legitimise my contact with the lead members of communities through the “chain referral” provided (Atkinson and Flint 2001). Later, this survey was supported by my access to the Community Broadband Network’s survey of notspots, undertaken in 2005. This enabled me to triangulate my findings and identify if I had missed any significant groups through my other approaches.

The survey I undertook identified a small number of communities fitting into my area of interest, and it appeared that I had identified the majority of the groups. One of the greatest challenges was to identify active groups. Initially I had decided that groups of interest would be those that have an active web presence, using this as an indicator of success and live activity. However it became clear that for a number of the groups, advertising their presence on the web was of low importance (particularly the “Cooperative” type of communities) and that it was not possible to use this as the single measure of identifying active communities.

Using multiple methods for identifying and making contact with communities was therefore very important. The richest source was through personal contacts and attendance at practitioner events. Only on one occasion did a group refuse to be interviewed for the research (West Haddon & Winwick Community Broadband Limited); I had not met them in person, and was cold-calling over the telephone. The ongoing monitoring of literature and websites did not turn up many additional groups and this was supported by academic literature reviewing and contacts in my new domain as an academic, coming across other researchers studying similar and even the same communities (Malina 2001; Skyva 2002; Williams 2005). In summary I believe this approach was satisfactory and identified the majority of the active communities at the time of research.

8.5.2 Semi structured interviews and community observation

Having identified the communities I wished to make contact with, I contacted the lead members and asked if it would be possible to interview them to understand their

networked communities and their motivations. Wherever possible I sought to interview the lead members in their own localities in order to enable me to observe the environment and meet other members, and also to be on the members' own known ground. This was a successful approach and on most occasions my local contact would invite other members along to participate in the interview, invariably inviting me on a tour of the local networked community. I felt that my dual role as an academic researcher and a fellow practitioner was useful in these situations as I was able to identify with and understand the challenges faced by the groups from my personal experiences. Having more than one member of the community present during interviews and informal discussions during the tours gave me the advantage of multiple voices, a recognised value of group interviews (Litosseliti 2003). Interviewing in the community members' own locality in a place of their choice satisfied Krueger's identification of a "permissive, non-threatening environment" (Krueger 1994, p. 6), which I believe led to more open and relaxed conversation. The offer by me to buy lunches or drinks was always well received.

Interviews were scaffolded by a number of questions, asked consistently across all groups, though the semi-structured and open ended nature of the conversations meant that interactions would move informally to cover many topics, some also very informative. Similarly, end user interviews, when undertaken in Digcoop, were conducted in a place of the interviewee's choice. These were more tightly structured by multiple choice questions with a number of open ended questions to provide additional rich data. When visiting each community I took notes and photographs and used these as supplementary data to support the interviews. Often the interviews extended into longer visits as the participants were keen to show me around their

communities, however the questionnaire was sometimes too long, and if I was to revisit the process I would develop a shorter version. Fatigue did set in on occasion and I had to cut short a couple of interviews as I felt I had exhausted goodwill after a period of time.

The interviews were my main source of information and as such must be considered for bias. Interviewing the lead members of the communities, I was hearing their view of the situation. Ideally, it would have been better to also interview general members of each networked community to identify whether the lead members views were similar to the wider memberships views, and indeed to have had the opportunity to identify and interview non-participants. This would have enabled me to have triangulated my data and increased the reliability of the reporting. In some cases, groups had other resources that I could explore to corroborate or contrast the views given to me by the lead members. Only on one occasion, in Digcoop, was I able to interview the wider membership of the networked community, and interviewing wider membership in all cases would have strengthened the research. A second interview with both lead members and wider membership towards the end of the research, reflecting on their progress during the period and also commenting on my perceptions of their work, would have strengthened the work.

8.5.3 Participatory research with Digcoop and Mehetnet communities

To investigate how two networked communities might take up and use social software tools within an intranet, I undertook a participatory research approach. My

aim was to use a method that would assure that decisions would be driven by community members, encourage participation, and ensure a sustainable development process. My goal was to create an equitable outcome, with the community having the opportunity to explore how social software tools might be used and ultimately have an intranet that would benefit their community beyond the end of my research, without being dependent on my continued input.

I was using a research method that I had not tried before. As a result, I struggled with balancing three key challenges. These were:

- Collaboration and decision making: understanding how much I should lead the project and how much I should let it take its course
- Project management and ethics: concern about imposing my will on participants and the withdrawal of consent
- Time: managing the timescale of the research fieldwork against community progress

I was keen that the planning required to set up and configure the community intranets should be made in collaboration with the members of the community and that they should have the final say in all decisions. While this appears to be a simple process I realised tensions existed between the goals of my research and the goals of the community. A key research goal was to get intranets up and running with a range of social software tools in both communities with a wide range of community participation, offering data that I could analyse.

However, the commitments of the lead members meant that arranging meetings and coming to decisions took longer than expected. In both communities, deliberation and consensus building was seen as highly important. The informality of the structure of the networked community organisations, and their varying degrees of legitimacy to speak for the residents of the neighbourhood meant that lead members would refrain from making a decision until they felt they were confident of representing the views of their residents. As Maguire notes: “While direct community action is an intended outcome of participatory research, people may also decide not to act at a particular point in time... The important point is that those involved in the production of knowledge are involved in the decision making regarding its use and application to their everyday lives” (Maguire 1987, p. 48).

In some cases, I made some decisions on how we should proceed with setting up the intranets, acting as an expert consultant advising them upon what route we should take (e.g. which software we should consider). This presented a conflict as I had to play the role of decision-maker on the communities’ behalf whilst undertaking a participatory approach with the community making their own choices.

Associated with this issue of decision-making was the overall collaborative project management of the development and introduction of the intranets in the two communities. Again this tension was derived from my twin roles as researcher and practitioner. As a practitioner in Digcoop, I had the authority to make decisions about how we would develop the intranet proposals and how we would then subsequently operate the system and promote it to our fellow residents. In Mehetnet, as a fellow practitioner helping along my neighbouring community, I could offer expertise and

advise on paths we should take. However in both cases, conscious of my role as a researcher and committed to a participatory approach, I was keen not to influence the direction the groups were taking. This, I felt, would bias the results and lead to greater dependency upon me reducing the sustainability of the systems. It might be argued that this led to delays and greater dependency on the few lead members, and therefore slowed down progress. I was also concerned that by taking a leading role in project managing the development of the intranets, I might have to make unpopular decisions. My overarching concern was to maintain the goodwill of the two communities, as if either of them withdrew their consent and discontinued their collaboration my research would be placed in jeopardy.

The greatest challenge of undertaking a participatory approach to the implementation of the intranets was managing the conflicting time frames demanded of a research project as opposed to a community initiative. As Day and Cupidi note (2004a), externally driven developments often function on a project basis: fixed timescales, clearly defined goals and objectives, and a date for termination. Locally driven developments are more often perceived as community initiatives: open ended, taking as long as they need to take, often accepting of delays, periods of dormancy and changes in purpose. While I wanted to utilise a participatory research methodology, the collaboration was nevertheless initiated by me as a piece of PhD research fieldwork. I was bounded by a fixed timescale, goals, and a date after which I had to terminate (or at least highly reduce) my input. As a researcher, I was seeking concrete evidence and outputs at a fixed point in time, while as a practitioner I was happy to accept that delays would occur and we might end up elsewhere from an anticipated outcome. Often members of the community might not have been

available, or cancel when I had allocated a day for fieldwork. This was most evident with Mehetnet, where developments were dependent on the lead member Anna and her availability, and also true of Digcoop's small team.

I was concerned to what degree I could actively move the initiative forward and undertake specific actions when a representative of the community was not available. I considered this to me approaching the initiative as an external intervention and not working alongside the community in a participatory approach. If the community did not choose to move forward, then surely I should also respect that decision despite the fact that this did not help my PhD research? Herein lay the greatest conflict between the fixed timescale of the PhD and the open-ended timescale of a community development. I decided the best decision was to let the intranets develop at a community-led pace, resulting in less progress than hoped within the time period allocated to fieldwork. In some ways therefore the research could be said to have failed, as I was not able to analyse usage of the community intranets, however it enabled me to consider my application of a participatory approach within a PhD research project. Ideally, both communities may have benefitted from longer term collaborations, with more time spent over a greater period and it is arguable that the PhD research period is too restrictive for a community collaboration of this nature.

8.5.4 Challenges of leaving the community to become a researcher

This research has emerged from my background as a practitioner in the field. I first entered the field as an initiator of a networked community, later becoming an

academic researcher studying the domain. This has had many benefits and drawbacks. I have benefitted as a practitioner as it has helped me reflect upon my working practice, allowing me to research the field and compare my community to others, as well as meeting many more initiators of networked communities.

However, the time spent away from my networked community (Digcoop) has meant that I could dedicate less time to its maintenance and development. In choosing to research and write about the phenomenon, and reflecting upon what may make such an initiative successful or not, I may have been less effective at managing the development of my own networked community. By moving away to study in another town and spending time in researching networks I put physical distance between myself and my networked community. This meant I was not able to respond as quickly to problems and less able to interact informally with my former neighbours. As time progressed I was less of a member of the community itself, so less able to sense requirements and respond to needs. I continued as one of the initiators of the networked community and worked alongside my colleagues to evolve both the infrastructure and the services, however I was able to put in less time than previously and the rate of progression slowed noticeably. Whereas an ethnographer spends time immersing themselves within a community to reach the point at which they are accepted and can make observations about their locality and the people without too much distraction, I was taking a reverse path. In some ways, my work has been the reverse of the approach of Wright (2005) and Hampton (2001b) immersing themselves in their communities and researching once 'embedded'. My challenge was to maintain my ties while increasing my distance.

8.5.5 Managing the dual identities of researcher and practitioner

A significant challenge in undertaking this research was managing the dual identities of researcher and a practitioner in the domain. The key aspects of this were managing research participants' perceptions of my dual identity, and balancing the goals of researcher and practitioner.

Contacting networked communities and presenting myself as a 'researcher' had both positive and negative effects on the information I was able to gather. On the one hand, this gave me credibility, and even value. For some practitioners, interest from an academic researcher represented external validation of their labours. That 'the establishment' would take an interest in their work was considered notable, and in some cases people were keen to tell their stories. As an academic researcher and previously unknown entity, I was seen as a neutral, external person and in some cases people were happier to communicate their goals and concerns with me as an outsider. In other groups, however, the status as an outside academic was more of a hindrance. In some groups, association with formal academia was viewed with suspicion and at least in one case, Redbricks, the initiators noted their "research fatigue": they were fed up of external authority figures asking to see their community and interview them. My alternative identity as a practitioner was therefore very useful as a balance and in some cases I felt carried more authority and offered more credibility. Like Orr's photocopying technicians, I was able to exchange "war stories" (Orr 1996) with my fellow practitioners, and ask pertinent, informed questions about technical and operational minutiae, reflecting upon my own experiences and practices in my networked community. Managing both roles could

be difficult; as a researcher I was keen to optimise my time with each networked community and draw out as much information as I could about how each group operated, while as a practitioner my goals were to make contacts and exchange practical knowledge, sometimes at odds with my academic goals.

8.5.6 Fair trade research

As proposed in Chapter 3, Section 3.4.2, neither interviewees, nor the members of the two communities who collaborated with me in developing the social software and intranets were paid. I was, however, concerned to undertake an ethical approach to the research, attempting to maximise the benefits the networked communities gained from their participation. By attempting to undertake a “fair trade” approach where both parties equally benefitted, I found myself continually returning to the question: what do these people get from me by participating in my research? It is clear I benefit: I gain research data, I get a thesis and other publications from my involvement. But what benefit does my intervention in these people’s lives and taking up their time bring to them? As Pete and Cae of Redbricks jokingly noted to me, I was lucky to have their time as they were bored with showing people round and it got in the way of their ‘real work’ – a comment that they had also made to Skyva and she had noted in her report of their activities (Skyva 2002).

As noted in Chapter 3, Section 3.5.4, I was keen to share knowledge, and used my networking role moving between communities to highlight good practices undertaken by other communities, and establish contacts between groups where possible. Noting Krueger’s recommendation to undertake meetings in “permissive,

non-threatening environment[s]” (Krueger 1994, p. 6) I scheduled many meetings in local cafes or pubs where I could pay for meals or drinks in return for the participants time. For the more significant involvement by the two communities involved in the second part of the fieldwork research, exploring social software uptake, I arranged for the servers that would be running the software to be given as gifts to the communities (thanks are due to the Open University for these donations). I was keen that the outcome of this aspect of the research would be intranet software run and managed by the local communities so I placed emphasis on ensuring software and training was in place to ensure the communities would be left with sustainable, running systems after I had left, without the communities being dependent on me. I was very keen to avoid the situation that I had seen in externally managed networking projects where at the end of the funding period, expertise and even hardware and software is withdrawn leaving the host community sometimes in a worse condition than when the intervention is first made. At the end of the research period, Digcoop was left with a running intranet service managed by the lead members of the community, and Mehetnet had been donated the server to use as they felt best, either for intranet or other purposes.

8.6 Summary

In this chapter I have summarised the research, and provided an overview of the current state of the digital divide and grassroots initiated networked communities. I have indicated some of the lessons learnt that policy makers may apply to help support local networking initiatives, and encourage neighbourhood responses to

digital divides. Finally I have reflected on the methodological approaches used and challenges faced.

The ‘digital divide’ as first considered at the commencement of the thesis has been unpacked during the research and a more nuanced approach revealed, matched by more considered discourse during the research period. However access still dominates discussions at a policy level, and there are still multiple inequalities to be overcome across the UK. Local community activism still has a very important role to play in helping supporting people in overcoming and readdressing these inequalities. Overall, there is more widespread and more affordable digital access in the UK, but there is still a rural-urban divide in provision, and as the digital economy grows and more data becomes available through the open data movement further divides are opening up that may be addressed by grassroots driven activism. The majority of groups that were studied in the research continue, and they may inform a wider discussion on the value of volunteer led groups and the challenges faced when developing socio-technical artefacts as community initiatives. In summary, although working with these groups has been challenging and has not proceeded as smoothly as hoped, the lessons learnt may also inform future research in this field.

In the final chapter I will consider the overall conclusions of the research, consider its wider relevance, and consider potential future developments that may be explored as a result of the work so far.

9 Discussion: implications for wider discourse

9.1 Introduction

In this chapter I reflect on the research as a whole. I revisit the original research propositions, aims and objectives, consider to what extent these have been answered, and where they have raised further questions. I examine how the research may have implications for wider discourses, and explore possible future directions.

9.2 Reflection on the research propositions

The research has focused on three primary propositions, with the goal of exploring the phenomenon of grassroots initiated networked communities. I will now consider to what extent these propositions have been addressed.

Proposition 1:

Bringing citizens online as part of a community, rather than individuals, is a more effective and sustainable method of enabling individuals to 'cross the digital divide' and stay across the divide. An individual is more likely to cross the divide and stay across as part of a community. The community can offer support, and brings with it social needs and purposes.

Through the research I have explored a number of different approaches to bringing citizens online, through the literature review, the survey, and the participatory

research alongside communities. I have identified that ‘crossing the digital divide’ is not a simple journey from one state to another, disconnected to connected, but consists of overcoming and continuously readdressing multiple insufficiencies. I have witnessed clear examples where addressing these challenges as part of a community rather than an individual brings common purposes (community interactions), social support and shared expertise. For the communities studied, the establishment and operation of the initiative itself became a community venture and engendered social interaction and shared purpose. This also acted as a catalyst for residents to describe their community ambitions and articulate their desires for how the community should interact, and express pertinent local concerns. During the research fieldwork, I have seen a preference by participants to draw on community expertise, the local, “warm expert” (Bakardjieva 2001) when confronted with problems maintaining connectivity or using associated software tools and services. At the end of this research, seven years after the fieldwork survey, I found that the groups most likely to be continuing and supporting their wider membership were the ‘Cooperative’ type groups, which leads me to conclude that a community approach, where the initiators have strong local ties, enables a greater likelihood of overcoming the inequalities defined by DiMaggio and Hargittai (2001).

In summary, the research has focused on community-based approaches. I cannot compare the success rates of bringing citizens online as part of a community against as individuals, however I have clear evidence that a community-based approach affords citizens a range of benefits for participating as part of a local group.

Proposition 2:

Developing a bottom-up networked community project based within an existing community of locality, where there is already a significant level of social interaction, is more likely to succeed than implementing a top-down networked community project into an arbitrarily selected community

The exploration of both externally driven networking projects (Chapter 2) and grassroots initiated networked communities (Chapters 4 – 7) has identified that working from within a local neighbourhood can bring benefits and aid long term sustainability. Utilising existing social networks and developing an infrastructure based on the goals of the community is more likely to result in a shared resource that the members will feel greater ownership of, will invest more in its long term sustainability and which will thus more closely reflect the goals and needs of that community. Undertaking a networking initiative from a community perspective also implies taking a more open-ended approach, without necessarily a set deadline and tightly constrained set of targets. This is a different approach from externally funded project based interventions, which are likely to have goals, timelines and funding constraints dictated by bodies external to the recipient community. When building from a grassroots perspective, it is important to understand that the community may work at a different pace to that expected from an externally funded project, and that the community may view the journey as important as the end point. It may take longer to reach the originally planned goals and the community may decide to change direction and change their goals as part of the process.

I have identified a small but active group of initiatives across the UK, the majority of whom continued to operate, in particular the Cooperative type of groups. In comparison, the majority of the externally funded projects that were identified in the initial research survey no longer exist in the form that they were first encountered, with end of funding being a significant reason for ceasing operation. The bottom-up approach, however, also brings with it challenges, as grassroots developed networking initiatives may struggle with lack of resources and limited expertise to draw upon; the issue of critical mass is a significant factor. The most successful groups appear to be those whose membership is most closely aligned with the goals of local residents (the Cooperative type groups) and those who are actively in contact with other similar groups. During the course of this research I have witnessed the emergence of networking associations such as the Community Broadband Network, and the Independent Networks Cooperatives Association who look to share expertise and consolidate their memberships to apply greater pressure on policy makers.

Proposition 3:

Appropriate social software can enhance participation within, and the sustainability and evolution of, a networked community

The research did not explore social software as far as was originally hoped. In the first community I worked alongside, Digcoop, an intranet was started and a little use of social software was noted during the research fieldwork period. In the second community, Mehetnet, the intranet was not running by the end of the research fieldwork period, so the only social software used by the community was an

externally hosted mailing list. In these terms, I can only note the research as being inconclusive.

However, in both groups the planning and development of the intranet brought community members together and acted as a catalyst to help them articulate their desires for the types of community interactions that they wanted to see. As such, the shared creation of the intranet and consideration of constituent tools and services can be seen as helping to engender social interaction, enable community reflection, and evolve the networked community. In both communities simple tools such as the mailing list in Mehetnet and network status tools in Digcoop were taken up and used by participants, so it may be argued that there was an interest in tools and services despite barriers (identified in Chapter 7) which held back the development of the intranets as planned.

The use of externally hosted social software tools has been actively embraced by the Digcoop membership since the end of the research fieldwork period, where local social activism has been mediated by Facebook for at least three ongoing purposes: to raise awareness about a local planning proposal, and to promote two residents' musical activities. Why Facebook, rather than the intranet tools available, was chosen to promote interaction may be a topic for further research. Anecdotal evidence suggests a desire by community members to reach beyond the immediate geographical neighbourhood and draw on weak as well as strong ties.

In summary, the research did not proceed to the point where it would be possible to make strong conclusions about whether social software could enhance participation

in a networked community and support its long-term sustainability. However, the process triggered social interaction and reflection by community members about their goals and purposes, and these debates and the initial steps taken enabled detailed analysis and reflection to be undertaken considering the barriers to take-up. With neither group actively using social software hosted within the community initiatives, the network infrastructure nevertheless continues to be well used with stable levels of membership. In both cases lead members have communicated recently that they are considering further investment to maintain their networks, as these are seen as important aspects of their neighbourhood infrastructure.

9.3 Reflection on the research aims

At the outset of the work, I operationalised the research propositions through three aims (Chapter 1). I will now reflect on the extent to which these aims have been satisfied. Based on the research propositions, the aims of the investigation were noted as the following:

Aim 1:

To evaluate the prevalence of grassroots initiated networked communities in the UK, to investigate the goals, motivations, and objectives of these communities and their modes of operation

This has been addressed in Chapter 2 (literature review), Chapter 4 (survey of networked communities), and Chapter 5 (analysis of networked communities). My research for the survey identified a small number of grassroots initiated networked

communities across the UK, a figure that was supported by continuing monitoring over the intervening years, and triangulated by the data collected by the Community Broadband Network's national survey of notspots and community networking groups. However, many of the identified groups remain active with new networked communities establishing themselves, despite some of the original identified groups ceasing operation. In summary, there are a small number of grassroots initiated networked communities across the UK, perhaps 25- 30, and they continue to flourish and maintain their relevance. The survey of ten groups identified three distinct groupings: Pioneers, Subcultures, and Cooperatives. The survey enabled an analysis of these groups' goals, motivations and objectives, and the resulting typologies derived were supported by data collected from the Community Broadband Network's survey of community networking groups.

Aim 2:

To explore the role that social software might play within these communities and understand the factors that may lead to its successful adoption

This has been addressed in Chapter 4 (survey of networked communities), Chapter 5 (analysis of networked communities), and more specifically in Chapter 6 (a collaborative deployment of social software with the communities) and Chapter 7 (analysis of the barriers to social software adoption). The fieldwork survey ascertained current usage within ten groups, and the participatory research collaboration enabled a closer examination of how two specific initiatives engaged with social software. This Aim, though partially successful, made less progress than was originally hoped with the two partner initiatives but rich data was gathered

through the process of setting up the intranets and planning the social software services. Furthermore, barriers to adoption were also identified and analysed which informs the wider discourse.

Aim 3:

To draw lessons from grassroots initiated networked communities that can be applied in future networking initiatives and inform decision making at policy level

This has been addressed across the research investigation, and specifically in Chapter 8 (research summary and reflection). The survey of the wider group of grassroots initiated networked communities, and the more closely explored participatory research collaboration working with two groups, has revealed rich insights into the initiatives' goals and motivations. Grassroots initiated networked communities offer an alternative means of bringing individuals and communities online and overcoming digital insufficiencies. It would appear that government and commercial interventions are unable to bring all of the population of the UK online, and cannot overcome all of the insufficiencies experienced beyond access. This research may therefore help inform the discourse and inform decision making at a policy level. The research has already been published in conference papers, a journal article and book chapter (see publications at beginning of this research), contributed to the Community Broadband Network survey and research, and informed documents aimed at UK and European policymakers (Anderson, Dries et al. 2006; Anderson and Gaved 2006b; Gaved and Anderson 2006).

9.4 *Future directions*

This research has considered how grassroots initiated networked communities might address the digital divide. In undertaking the study it has led me to a more nuanced understanding of the complexities involved in researching the domain, the challenges and the range of possible methodologies that can be used to explore the area. Further research could be usefully undertaken building upon the work carried out so far. In this section I highlight a number of directions that could be further explored.

9.4.1 Further studies of grassroots initiated networked communities

As noted in a paper I wrote with Ben Anderson (Gaved and Anderson 2006), there are very few longitudinal studies of grassroots networking groups. In Chapters 4 and 8 this thesis reveals how initiatives change over time. Revisiting the groups at the end of the write-up was beyond the scope of this work, however, so I have only been able to make limited inferences about the reasons for changes. A more detailed longitudinal investigation establishing which factors lead to an initiative's sustained success over a longer period of time would be worthwhile and would provide greater insight than was possible in the short fieldwork research period so far undertaken. Such a study may also inform how to make volunteer run groups more sustainable in the long term.

This research has only studied ten groups in any detail; a study of a larger number of groups, possibly using different research methodologies, would provide richer data and help confirm or confound the propositions raised in the current work. A potential starting point would be to work with the Community Broadband Network or the Independent Networks Cooperative Association gaining access to their wider membership and exploring the work using these larger populations of groups. This would also offer the advantage of investigating a wider spectrum of networking groups beyond the volunteer-run grassroots initiated networked communities studied in this dissertation.

9.4.2 Social software applications for networked communities

In this study I undertook an initial exploration of social software applications and their use within grassroots initiated networked communities. Like Wright (2005), I discovered only limited use of these tools within the research fieldwork timeframe. The research fieldwork period limited how much research could be undertaken combined with the other goals that I had set myself. A further study focusing specifically on social software uptake and usage within communities, assigning a greater period of time in which to monitor activity, might provide deeper insights as to which tools and services best support community interaction and also clarify which barriers hinder their uptake.

A limitation of the research was that it was proposed in early 2003, just before the explosion of social software aimed at the wider online population. As has been noted in Chapter 7, this may have been a significant factor in limiting take-up of local tools

and services within the collaborating communities. At the time of writing (early 2011) there has been a proliferation of web-based social software used by large numbers of internet users, including the residents of the communities I worked with. Revisiting the landscape of social software tools, both those hosted externally on the internet and those which can be run locally on an intranet, may provide insights into the current usage of social software tools and how the combination of both local and web accessed tools can support a community.

9.4.3 Research beyond the UK

Through this research I identified grassroots networking movements in other countries, for example the USA (Schuler 1994; Seattle Wireless 2004), Canada (Powell 2004), Spain (Guada Wireless 2004) and Greece (Bina 2005). Grassroots driven networking initiatives are likely to be present in many countries and a comparative study across countries might identify if similar factors affect their development. By drawing lessons from networked communities in different countries we would gain a richer data set to examine the propositions raised in the current work.

This research may have significant application in developing countries, where there is already an existing culture of self-provisioning of other services, such as water and electrical power supplies in lieu of effective or affordable governmental or commercial options. Lessons learnt in the research undertaken so far may be applicable in such communities for enabling low cost, appropriate, sustainable internet provision and community content at a local level. Remote and low income

communities are likely to be the last to be connected in lesser developed countries, even more so than the observed continuing division between rural and urban populations in the UK. A participatory research approach working alongside a number of communities in such a location, developing from the lessons learnt in the research so far may prove fruitful. A colleague in South Africa has noted that even where there is internet provision, it is high cost, of variable quality, and low bandwidth. In such circumstances the value of intranet tools and services that enable communities to interact and share resources locally without relying on external or international services may still be of high value for many years to come.

9.4.4 Intranets as community artefacts

I have identified that the community networks and the planned intranets acted as a catalyst for community interaction, bringing together members of the community to explore their desires and concerns about their local neighbourhoods, and to seek a means to improve community interactions. The network infrastructures and associated tools and services can therefore be thought of as community artefacts. It is worth noting that in the visited communities there was evidence of other such community artefacts being created and developed, such as a community garden (Redbricks) and shared nurturing of chickens (Mehetnet). A further research area therefore might be the consideration of the different types of artefacts generated by a community, and investigating if an IT based artefact has any particular affordances that may distinguish its value from other foci of community activity.

9.4.5 Volunteer cultures

This research has identified the importance of volunteers within the grassroots initiated networked communities. Almost exclusively, the planning, development and maintenance of the networked communities is carried out for no monetary return by local residents who have other commitments. Nevertheless these enthusiasts commit large amounts of time and energy, and sometimes their own money, to developing the networked communities. Further research into understanding the motivation of the volunteers within the networked communities would be worthwhile, building on the initial analysis undertaken so far. This may provide insights into how community led projects can be best supported to flourish, and whether ICT focused community groups represent particular types of groupings and interactions that can contribute to the greater discourse on community action, and pro-am culture (Leadbetter and Miller 2004). Intriguingly, despite the change in political direction of the UK during the undertaking of this research, this is a topic currently in favour with the present UK government as represented by its “Big Society” vision.

9.5 *Alternative research methods and approaches*

This research has identified the challenges of working alongside a small number of groups using an initial survey, interviews with lead members, and a participatory research collaboration with two groups. As a cross-disciplinary work, alternative research methods have presented themselves in the literature, and have been used by

colleagues researching similar fields. Further research into grassroots initiated networked communities using different research methodologies may provide greater insight into their *modus operandi*.

I have also become aware of how grassroots initiated networked communities may be viewed by different disciplines. This thesis can be considered a community informatics work, however an investigation of the groups viewed through the lens of other disciplines may also provide richer interpretations and greater insight.

Grassroots initiated networked communities might be considered through their relationship to local and national politics (e.g. eGovernment and social capital discourses), through the artefacts they construct (as an open source software investigation), or as instigators of new forms of urban architectures and third places (Gaved and Mulholland 2008).

9.6 Summary

This chapter has provided an overall summary to the research. I have identified that I have addressed the research propositions, aims and objectives as set out in Chapter 1. This work has perhaps revealed more questions than it has answered, and I have identified potential future research directions that could build on the work carried out and further inform the discourse.

Appendix 1: Lead members interview

Survey Questions for initiators

Last updated 16/10/2003

Outline

Community Knowledge: how do the initiators perceive the community they are working with? Will this be divergent with the end users of the connectivity project?

Connectivity Project: how do the initiators see the project? How does the project work?

Knowledge and skills: what does the individual think they contribute to the project? What do they see other people contributing?

Collaboration / information sharing: how much collaboration occurs between this project (and its initiators) and other projects?

Sustainability / lifespan: what lifespan is defined for the project? What mechanisms are in place to ensure the sustainability?

Training: subset of sustainability: how do the initiators develop skills within the membership?

Questions for initiators

Community Knowledge

Q1. Please describe the community you are working to connect.

Q2. What is the boundary of the community?

Q3. If you get everybody online in your bounded community, would you think it would be a good idea to expand the project? To how big an area? Would there be a maximum point of expansion? Is there an ideal size (physical size, number of people participating?)

Connectivity Project

Q4. How would you describe your project to somebody who wanted to find out what you are doing?

(How many people? Age range? Topics of shared interest?)

Q5. How would you describe the main benefits of the project to somebody else? Why should they get involved with your project rather than phoning up BT for a similar service?

Q6. What role do you play in this project?

Q7. Are there different levels of membership (either informal or formal)? What are they? How many/who is in each?

Q8. Would you describe yourself as an active or inactive member of the project?

Q9. How are decisions made within the project (e.g. priority of action, funding, expenditure)?

- Who's organising it? Who's involved with it? Who makes the decisions? How are the decisions made? What are the goals? What are the principles? What is the process for attaining the goals? Who funds the project? Where will revenue come from? What type of organization is it? Nonprofit, for-profit, government? A partnership? Is the project democratically run? Is it well run? Are all members of the community welcome? Are diverse opinions respected? Do the organizers have a good idea of what they're doing?)

Knowledge and Skills

Q10. What skills do you bring to the project?

Q11. What kinds of groupings of people exist in the project? What role does each grouping play within the overall project? (Looking for information on skills and abilities each group bring to the project)

Q12. Are there noticeable types of end-user in terms of their activity or involvement? What are these types and how would you describe each of them?

Collaboration / information sharing

Q13. Are you aware of any other people carrying out similar projects?

Q14. How much contact do you have with these other groups?

Q15. Do you see these other groups as possible collaborators or possible competition?

- In what ways is your project similar to the others? In what ways is it different?]

Q16. If someone told you they were planning to start a connectivity project in their own area, what advice would you give them?

Sustainability/ Lifespan

Q17. How long do you see this project going on for?

Q18. How does the funding operate (is it limited lifespan, dependent on grants, profit making...)?

Q19. What was your goal when the project started? Now? What do you see your goal being in ten years time?
(How successful do think the project is? Which goals have been met, which remain elusive?)

Q20. How long do you see yourself being involved in this project?

(Does the highly active/core group change over time? Do new end-users ever later become core members?)

Training

Q21. What training process do you have for new members?

(do you have any face-to-face training sessions? FAQs? Hand-outs? Books that people can borrow?)

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